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WHITE PINE BLISTER RUST CONTROL IN THE NORTHWESTERN REGION

January 1 to December 31, 1941

Herman E. Swanson, Senior Pathologist

INTRODUCTION

This report covers the blister rust control activities in the Northwestern Region for the calendar year 1941, as conducted by the Bureau of Entomology and Plant Quarantine, in cooperation with state and private agencies of Idaho, Montana, Washington, Colorado and Wyoming, the U. S. Forest Service and the National Park Service. Work was carried on in accordance with agreements between the Bureau of Entomology and Plant Quarantine and the other agencies.

A significant feature of the 1941 program was the resumption of financial contributions to the project by private agencies in Idaho. Funds were contributed by the Clearwater Timber Protective Association, the Potlatch Timber Protective Association and the Priest Lake Timber Protective Association. This was the first year since 1932 that private funds were contributed.

The year 1941, marked by heavy rains throughout spring, summer and fall, was favorable for blister rust development. However, the nature of these rains would seem to preclude any abnormally wide distribution of blister rust and severe introduction into new areas because of the heavy downpours which occurred throughout the period of greatest aeciospore dissemination. This conclusion is suggested by the fact that intensive scouting in the territory northwest of Yellowstone National Park, which is outside the heavily infected white pine areas of western Montana and northern Idaho and where blister rust was found on ribes in several locations in 1937, failed to reveal any blister rust infection. The year 1937 was a most favorable year for the spread and development of blister rust and was characterized by frequent light rains in contrast to the very heavy rains in 1941. On the other hand the wet conditions prevailing in 1941 were very favorable for increase in the amount of rust in localities where it was already present as evidenced by the great amount of infection that eventually developed on ribes near fruiting cankers.

Weather conditions interfered greatly with the orderly progress of ribes eradication with the result that the working season was one of the shortest in all the years of blister rust control work in the Northwest. This situation along with the great amount of labor turnover which was also partly the result of the adverse weather conditions reduced the amount of planned accomplishment in acreage worked by 30 per cent.

PROGRESS OF RIBES ERADICATION IN THE NORTHWESTERN REGION

State	Initial Work	Reeradication Work	Total
<u>Number of Acres Worked in 1941.</u>			
Idaho	11,676	41,218	52,894
Montana	4,579	2,387	6,966
Washington	<u>3,970</u>	<u>7,387</u>	<u>11,357</u>
Total	20,225	50,992	71,217

Number of Acres Worked in All Years.

Idaho	1,632,535	360,481	1,993,016
Montana	127,860	10,500	138,360
Washington	<u>123,132</u>	<u>36,620</u>	<u>159,752</u>
Subtotal	1,883,527	407,601	2,291,128
Colorado	14,859	1,962	16,821
Wyoming	<u>21,760</u>	<u>-</u>	<u>21,760</u>
Subtotal	<u>36,619</u>	<u>1,962</u>	<u>38,581</u>
Grand Total	1,920,146	409,563	2,329,709

Detailed reports on the progress of ribes eradication are presented under the following headings:

1. Blister Rust Control, Inland Empire. This represents the commercial white pine area of northern Idaho, northwestern Montana, and northeastern Washington. In addition, there is a separate report for each national Forest area and adjacent state and private lands. These individual reports include:

- a. Cabinet and Kootenai operations (Montana)
- b. Clearwater operation (Idaho)
- c. St. Joe operation (Idaho)
- d. Coeur d'Alene operation (Idaho)
- e. Kaniksu operation (Idaho and Washington)
- f. Mount Spokane operation (Idaho and Washington)

2. Blister Rust Control, National Parks

- a. Mount Rainier
- b. Glacier

3. Blister Rust Control, Central Rocky Mountain Region

- a. Colorado
- b. Wyoming

The 1938 annual report contains the last report on ribes eradication work performed in this region.

ORGANIZATION AND ADMINISTRATION

The Bureau of Entomology and Plant Quarantine is responsible for the general planning, coordination, and technical supervision of the blister rust control program, for the supervision of all cooperative work on state and private lands and for the work in connection with development of methods of control and control investigations. The Forest Service and National Park Service are responsible for the direct supervision of control work on their lands.

The ribes eradication program, which constitutes the major part of the blister rust control project, was made up of the following units in 1941:

	<u>Camps</u>	<u>Workers</u>
Bureau of Entomology and Plant Quarantine:		
ERA (financed by WPA allotments)	7	210
Cooperative (financed by federal, state and private funds)	4	137
CCC (S-camps in Idaho)	<u>1</u>	<u>31</u>
Total	12	428

U. S. Forest Service:

Regular (financed by federal funds)	33	1,181
CCC (F-camps)	9	272
ERA (financed by WPA allotments)	<u>1</u>	<u>30</u>
Total	43	1,483

National Park Service:

Regular	2	65
CCC	<u>2</u>	<u>62</u>
Total	4	127

Summary:

	Season 1940		Season 1941	
	<u>Camps</u>	<u>Workers</u>	<u>Camps</u>	<u>Workers</u>
Regular and Cooperative	34	1,204	39	1,433
ERA	20	1,266	8	240
CCC	<u>23</u>	<u>1,453</u>	<u>12</u>	<u>365</u>
Total	77	3,923	59	2,038

APPROPRIATIONS

Bureau of Entomology and Plant Quarantine (Northwestern Region)

Regular Appropriation:

Fiscal year 1941 \$ 31,700.00

Fiscal year 1942 (as of 12/31/41)

Project 3101.14 (Adm.) \$74,400.00

Project 3103.14 (Coop.) 27,041.00

Project 3104.14 (Purchase) 650.00 102,091.00

ERA (WPA) Allotments:

Fiscal year 1941:

Idaho 212,860.00

Washington 33,000.00

Administrative 6,280.00

Fiscal year 1942 (7/1/41-12/31/41):

Idaho 77,000.00

Washington 13,750.00

Administrative 2,600.00

Cooperative Funds: (deposited with U. S. Treasury)

State of Idaho 14,243.60*

Clearwater Timber Protective Association 6,366.32

Potlatch Timber Protective Association 5,107.46

Priest Lake Timber Protective Association 4,232.62 30,000.00

*Biennial appropriation by Idaho State Legislature for period April 1, 1941, to March 31, 1943, was \$38,000.00.

EXPENDITURES FOR CALENDAR YEAR 1941

Bureau of Entomology and Plant Quarantine:

	<u>Fiscal Year 1941</u>	<u>Fiscal Year 1942</u>	<u>Total</u>
<u>Regular Funds:</u>			
Idaho (3101.14)	\$42,327.42	\$19,485.69	\$ 62,313.11
Idaho (3103.14)	-	6,810.78	6,810.78
Subtotal Idaho	\$42,327.42	\$26,296.47	\$ 69,123.89
Montana (3101.14)	3,140.13	5,950.70	9,090.83
Washington (3101.14)	2,465.83	5,256.39	7,722.72
Wyoming (3101.14)	-	833.69	833.69
Total	\$48,433.33	\$38,337.75	\$ 86,771.13

ERA (Project Funds):

Idaho	\$48,174.25	\$47,541.51	\$ 95,715.76
Washington	9,145.70	11,567.30	20,713.00
Total	\$57,319.95	\$59,108.81	\$116,428.76

ERA (Administrative Funds):

Idaho	\$ 3,460.00	\$ 2,070.00	\$ 5,530.00
Washington	659.05	487.61	1,146.66
Total	\$ 4,119.05	\$ 2,557.61	\$ 6,676.66

Cooperative Funds:

State of Idaho			\$ 7,542.73
Private (Idaho)			15,756.40
Total			\$ 23,299.13

Bureau of Entomology and Plant Quarantine (Summary):

<u>State</u>	<u>Regular</u>	<u>ERA</u>	<u>Cooperative</u>	<u>Total</u>
Idaho	\$69,123.89	\$101,245.76	\$23,299.13	\$193,668.78
Montana	9,090.83	-	-	9,090.83
Washington	7,722.72	21,359.66	-	29,582.38
Wyoming	833.69	-	-	833.69
Total	\$86,771.13	\$123,105.42	\$23,299.13	\$233,175.68

U. S. Forest Service:

<u>State</u>	<u>Regular</u>	<u>ERA</u>	<u>Total</u>
Idaho	\$375,898.32	-	\$375,898.82
Montana	33,936.00	\$5,421.00	39,357.00
Washington	35,179.18	-	35,179.18
Total	\$445,014.00	\$5,421.00	\$450,435.00

National Park Service:

<u>State</u>	<u>Park</u>	<u>Regular</u>
Washington	Mount Rainier	\$8,780.63

Note: Expenditures from CCC funds not included in this report.

EXPENDITURES BY ALL AGENCIES FOR ALL YEARS

Bureau of Entomology and Plant Quarantine (1922-1941):

Federal Funds:

State	Regular	ERA	NIRA	Total
Idaho	\$1,234,284.49	\$3,002,009.44	\$470,341.62	\$4,707,135.55
Montana	201,043.92	196,847.11	83,306.79	486,197.82
Washington	219,592.47	453,898.95	105,199.60	783,691.02
Subtotal	\$1,654,920.88	\$3,657,755.50	\$664,343.01	\$5,977,024.39
Colorado	11,852.04	59,396.51	8,041.45	79,290.00
Wyoming	11,314.28	58,283.96	7,107.41	76,705.65
Subtotal	\$ 23,166.32	\$ 117,680.47	\$ 15,148.86	\$ 155,995.65
Grand Total	\$1,678,087.20	\$3,775,435.97	\$679,496.87	\$6,133,020.04

Cooperative Funds (1928-1941):

State	State	Private	Total
Idaho	\$139,691.23	\$104,140.03	\$243,831.26

U. S. Forest Service (1930-1941):

Forest	State	Regular	ERA	NIRA	Total
Clearwater	Idaho	\$ 606,537.54	\$ 78,808.87	\$ 334,645.93	\$1,019,992.34
St. Joe	Idaho	1,219,110.14	6,983.40	376,356.66	1,602,450.20
Coeur d'Alene	Idaho	491,116.07	197,410.60	472,399.21	1,160,925.88
Kaniksu	Idaho	193,788.11	137,952.32	185,782.36	517,522.79
Kaniksu	Washington	134,605.72	-	134,320.68	268,926.40
Cabinet	Montana	135,994.22	108,618.46	149,858.06	394,470.74
Kootenai	Montana	39,076.14	28,233.00	-	67,309.14
Subtotal	Idaho	\$2,510,551.86	\$421,155.19	\$1,369,184.16	\$4,300,891.21
Subtotal	Montana	175,070.36	136,851.46	149,858.06	461,779.88
Subtotal	Washington	134,605.72	-	134,320.68	268,926.40
Grand Total		\$2,820,227.94	\$558,006.65	\$1,653,362.90	\$5,031,597.49

National Park Service (1930-1941):

Park	State	Regular
Mount Rainier	Washington	\$31,126.00

PERSONNEL

The following are the permanent personnel of the Bureau of Entomology and Plant Quarantine who were employed in the Northwestern Region during the calendar year 1941:

1. In charge of the Northwestern Region, H. E. Swanson, Senior Pathologist, Assistant Regional Leader, E. L. Joy, Forester.
2. Cooperative Local Control:
 - a. Montana Operation:
Technical Supervisor, A. S. Skoglund, Assistant Pathologist.
 - b. Clearwater Operation, Idaho:
Technical Supervisor, F. J. Heinrich, Associate Pathologist.
Checking Supervisor, H. J. Faulkner, Chief Scientific Aid.
 - c. St. Joe Operation, Idaho:
Technical Supervisor, H. J. Hartman, Associate Forester.
Assistant, J. C. Gynn, Assistant Pathologist.
Checking Supervisor, W. F. Painter, Assistant Pathologist.
 - d. Coeur d'Alene Operation, Idaho:
Technical Supervisor, A. L. Pence, Jr., Associate Forester.
 - e. Kaniksu Operation, Idaho and Washington:
Technical Supervisor, F. O. Walters, Associate Pathologist.
Checking Supervisor, H. A. Brischle, Assistant Pathologist.
 - f. Mount Rainier and Glacier National Parks and Mount Spokane Operation, Idaho, Montana, Washington:
Technical Supervisor, M. C. Riley, Associate Forester.
3. Projects:
 - a. Control Investigations:
In charge, R. L. MacLeod, Associate Pathologist.
C. R. Stillinger, Assistant Pathologist.
C. M. Chapman, Chief Scientific Aid.
 - b. Development of Ribes Eradication Methods:
Ecological and Chemical, V. D. Moss*, Associate Forest Ecologist.
Mechanical, J. F. Breakey*, Assistant Pathologist.
 - c. Informational Work:
In charge, E. L. Joy, Forester.
H. M. Cowling, Chief Scientific Aid.

*Personnel assigned to Northwestern Region by H. R. Offord, Pathologist in charge of methods development in the West.

EXPENDITURES BY ALL AGENCIES FOR ALL YEARS

Bureau of Entomology and Plant Quarantine (1922-1941):

Federal Funds:

State	Regular	ERA	NIRA	Total
Idaho	\$1,234,284.49	\$3,002,009.44	\$470,341.62	\$4,707,135.55
Montana	201,043.92	196,847.11	83,306.79	486,197.82
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Subtotal	\$1,654,920.88	\$3,657,755.50	\$664,348.01	\$5,977,024.39
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Wyoming	11,314.28	58,283.96	7,107.41	76,705.65
Subtotal	\$ 23,166.32	\$ 117,630.47	\$ 15,148.86	\$ 155,995.65
Grand Total	\$1,678,087.20	\$3,775,435.97	\$679,496.87	\$6,133,020.04

Cooperative Funds (1928-1941):

State	State	Private	Total
Idaho	\$139,691.23	\$104,140.03	\$243,831.26

U. S. Forest Service (1930-1941):

Forest	State	Regular	ERA	NIRA	Total
Clearwater	Idaho	\$ 606,537.54	\$ 78,308.87	\$ 334,645.93	\$1,019,992.34
St. Joe	Idaho	1,219,110.14	6,983.40	376,356.66	1,602,450.20
Coeur d'Alene	Idaho	491,116.07	197,410.60	472,399.21	1,160,925.88
Kaniksu	Idaho	193,788.11	137,952.32	185,782.36	517,522.79
Kaniksu	Washington	134,605.72	-	134,320.68	268,926.40
Cabinet	Montana	135,994.22	108,618.46	149,858.06	394,470.74
Kootenai	Montana	39,076.14	28,233.00	-	67,309.14
Subtotal	Idaho	\$2,510,551.86	\$421,155.19	\$1,369,184.16	\$4,300,891.21
Subtotal	Montana	175,070.36	136,851.46	149,858.06	461,779.88
Subtotal	Washington	134,605.72	-	134,320.68	268,926.40
Grand Total		\$2,820,227.94	\$558,006.65	\$1,653,362.90	\$5,031,597.49

National Park Service (1930-1941):

Park	State	Regular
Mount Rainier	Washington	\$31,126.00

PERSONNEL

The following are the permanent personnel of the Bureau of Entomology and Plant Quarantine who were employed in the Northwestern Region during the calendar year 1941:

1. In charge of the Northwestern Region, H. E. Swanson, Senior Pathologist, Assistant Regional Leader, E. L. Joy, Forester.
2. Cooperative Local Control:
 - a. Montana Operation:
Technical Supervisor, A. S. Skoglund, Assistant Pathologist.
 - b. Clearwater Operation, Idaho:
Technical Supervisor, F. J. Heinrich, Associate Pathologist.
Checking Supervisor, H. J. Faulkner, Chief Scientific Aid.
 - c. St. Joe Operation, Idaho:
Technical Supervisor, H. J. Hartman, Associate Forester.
Assistant, J. C. Gynn, Assistant Pathologist.
Checking Supervisor, W. F. Painter, Assistant Pathologist.
 - d. Coeur d'Alene Operation, Idaho:
Technical Supervisor, A. L. Pence, Jr., Associate Forester.
 - e. Kaniksu Operation, Idaho and Washington:
Technical Supervisor, F. O. Walters, Associate Pathologist.
Checking Supervisor, H. A. Brischle, Assistant Pathologist.
 - f. Mount Rainier and Glacier National Parks and Mount Spokane Operation, Idaho, Montana, Washington:
Technical Supervisor, M. C. Riley, Associate Forester.
3. Projects:
 - a. Control Investigations:
In charge, R. L. MacLeod, Associate Pathologist.
C. R. Stillinger, Assistant Pathologist.
C. M. Chapman, Chief Scientific Aid.
 - b. Development of Ribes Eradication Methods:
Ecological and Chemical, V. D. Moss*, Associate Forest Ecologist.
Mechanical, J. F. Breakey*, Assistant Pathologist.
 - c. Informational Work:
In charge, E. L. Joy, Forester.
H. M. Cowling, Chief Scientific Aid.

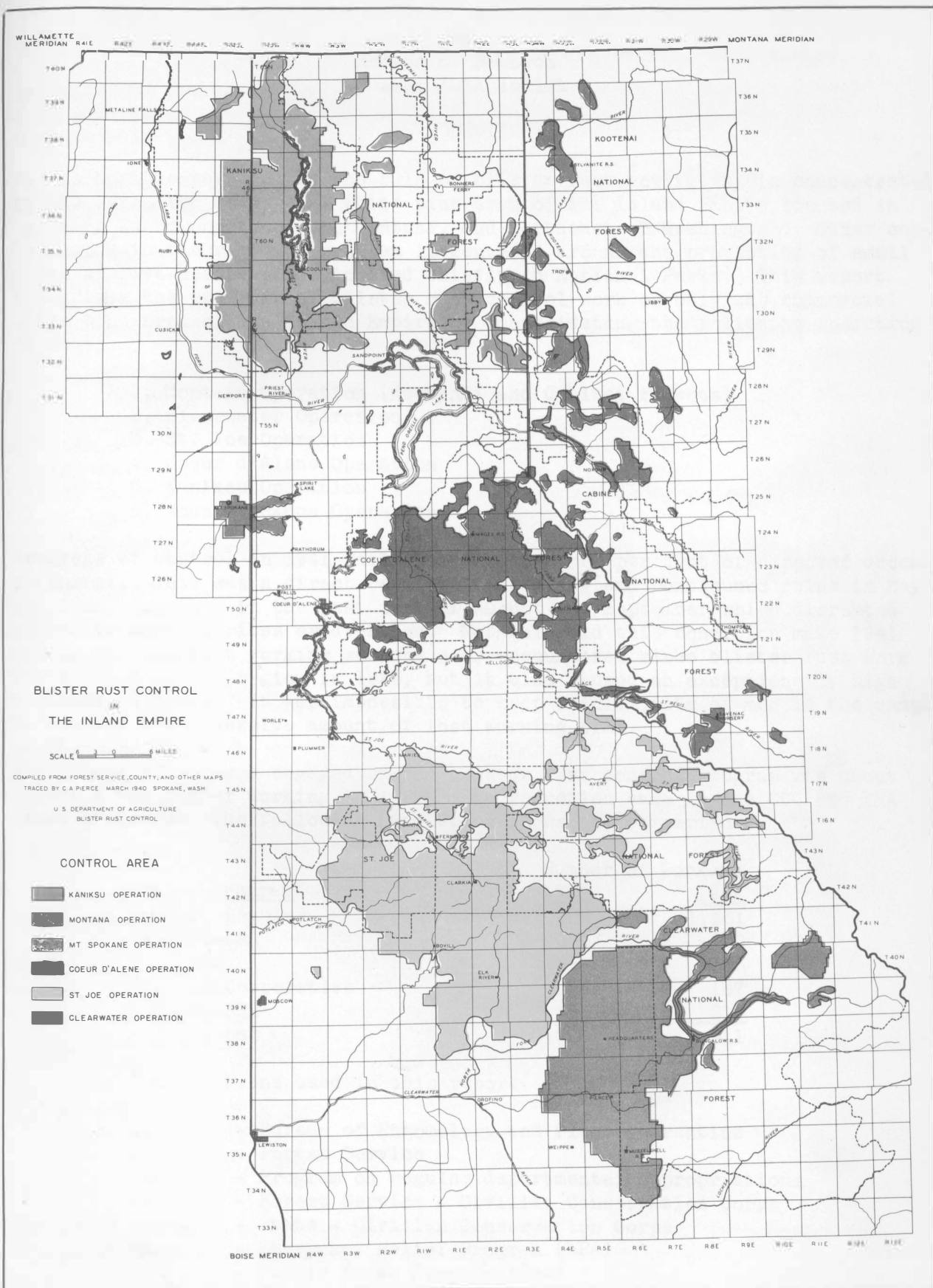
*Personnel assigned to Northwestern Region by H. R. Offord, Pathologist in charge of methods development in the West.

4. Business Administration and Clerical Work:

- a. E. G. Schmidt, Senior Administrative Assistant.
E. K. LaPrey, Field Assistant.
- b. M. L. McWold, Senior Clerk.
E. T. Dunlap, Assistant Clerk-Stenographer (Resigned).
- c. L. E. Klatt, Senior Clerk.
D. E. Anderson, Assistant Clerk-Stenographer.
M. M. McLean, Assistant Clerk-Stenographer.
J. R. Pringle, Junior Clerk-Stenographer.
M. Wilson, Junior Clerk-Stenographer.
- d. H. D. Langley, Junior Administrative Assistant in charge of personnel.

The following are the personnel of the Forest Service in charge of blister rust control work on National Forest lands:

- 1. Cabinet and Kootenai National Forests, Montana - C. H. Johnson, Associate Pathologist.
- 2. Clearwater National Forest, Idaho - D. Kyle, Assistant Forester.
- 3. St. Joe National Forest, Idaho - D. J. Moore, Assistant Pathologist, and M. D. Oaks, Principal Agricultural Aid.
- 4. Coeur d'Alene National Forest, Idaho - N. D. Nelson, Assistant Forest Supervisor.
- 5. Kaniksu National Forest, Idaho and Washington - F. O. Walters, Associate Pathologist (Bureau of Entomology and Plant Quarantine and U. S. Forest Service), Kermit Miller, Assistant Pathologist.



BLISTER RUST CONTROL, INLAND EMPIRE, 1941

By

Herman E. Swanson
Senior Pathologist

INTRODUCTION

In the Northwestern Region the bulk of blister rust activities is concentrated in the extensive commercial white pine area of the Inland Empire located in northern Idaho, northwestern Montana, and northeastern Washington. Other control work in the region's program is centered around the protection of small units of five-needle pines located chiefly in National Parks. This report summarizes the progress of blister rust control work on only the commercial white pine area of the Inland Empire by consolidating the following operation reports:

1. Montana Operation (Kootenai and Cabinet Forests)
2. Clearwater Operation
3. St. Joe Operation
4. Coeur d'Alene Operation
5. Kaniksu Operation
6. Mount Spokane Operation

Progress of control in 1941 fell short by about 30 per cent of expected accomplishment. This was a direct result of the heavy and continuous rains in May and June, and then in the last part of August and September which disrupted effective work on ribes eradication. Not only did this condition make 1941 one of the shortest working seasons ever encountered since blister rust work was started in the region in 1924, but it also caused an exceptionally high turnover in labor. It was impossible to keep a full quota of men in the camps because of the excessive amount of lost working time.

The number of workers engaged in the blister rust control program was about one-half the number working in 1940. The reduction came in the CCC and ERA (WPA) programs. The following tabulation shows the comparison:

Program*	Number of Workers	
	1940	1941
FS-Regular	1,138	1,131
FS-ERA	372	30
CCC	1,268	303
EQ-Cooperative	66	187
EQ-ERA	<u>887</u>	<u>210</u>
Total	3,738	1,911

*Designations used in this report:

- EQ - Bureau of Entomology and Plant Quarantine
- FS - Forest Service
- Reg. - Program on regular departmental appropriations
- F-CCC - Forest Service - Civilian Conservation Corps
- S-CCC - State - Civilian Conservation Corps
- ERA - Emergency Relief Program (WPA)
- NIRA - Public Works Program (PWA)
- EQ-Coop. - Program financed cooperatively by Bureau, State of Idaho and Timber Protective Associations

In view of the abnormally bad weather conditions, short season, large labor turnover and much smaller crew, the net accomplishment of 69,738 acres worked compares favorably with the 115,608 acres worked in 1940. It is significant to note that the average number of ribs pulled per acre is declining from year to year, indicating that the more difficult areas have been worked and that less difficult areas will be encountered in the future. In 1939 the average number of ribs pulled per acre was 272, in 1940 it was 170, and in 1941 it was 125. In line with this has been a corresponding decline in the amount of labor required to work an acre. In 1939, 1.51 man-days per acre were required, in 1940, 1.22 man-days, in 1941, 1.10 man-days. These trends are continuing even though there is an increasing concentration of work on reproduction stands and reproducing cutover areas which are normally the most difficult to work.

STATEMENT OF EXPENDITURES AND COSTS

The following tables include those expenditures made in connection with the ribs eradication program or projects directly associated with this activity. Effective man-day costs are high as a result of the great amount of lost time due to weather conditions. These expenditures include federal funds expended from appropriations directly allotted to the Bureau of Entomology and Plant Quarantine and the U. S. Forest Service, and state and private funds deposited with the U. S. Treasury.

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941 INLAND EMPIRE

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	\$445,014.00
	ERA	5,421.00
	Total	450,435.00
Bureau of Entomology and Plant Quarantine	Regular	36,649.54
	Regular-Coop.	6,810.73
	ERA	100,104.12
	Total	143,564.44
State of Idaho and Timber Protective Associations	State	7,542.73
	Private	15,756.40
	Total	23,299.13
All Agencies	Total	\$617,293.57

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941
INLAND EMPIRE

Item	Forest Service			Bureau of Entomology and Plant Quarantine			Contributed Funds	Total
	Regular	ERA	Total	Regular	ERA	Total	State of Idaho and Timber Protective Associations	
Sal. perm. men	\$ 14,009.29		\$ 14,009.29	\$27,366.90		\$ 27,366.90		\$ 41,376.19
Salaries, temp. men	40,167.49	\$ 183.00	40,350.49		\$ 13,830.36	13,830.36		54,181.35
Wages, temp. labs.	291,849.79	2,942.00	294,791.79	4,356.90	67,146.37	72,003.77	\$23,299.13	390,094.69
Subs. supplies	71,487.24	2,004.00	73,491.24	7,615.49	10,431.06	18,046.55		91,537.79
Equipment	12,611.13	161.00	12,772.13	223.63	395.75	619.47		13,391.60
Trucks	1,587.67	53.00	1,645.67	1,523.36		1,523.36		1,645.67
Travel and transp.	4,242.59	53.00	4,300.59		4,132.02	4,132.02		9,961.47
Chemicals	1,536.97		1,536.97					1,536.97
Twine	4,055.04		4,055.04					4,055.04
Other supplies	3,466.79	15.00	3,481.79	1,868.49	4,167.52	6,036.01		9,517.80
Total	\$445,014.00	\$5,421.00	\$450,435.00	\$43,460.32	\$100,104.12	\$143,564.44	\$23,299.13	\$617,293.57

TABLE 2A

DISTRIBUTION OF BLISTER RUST CONTROL EXPENDITURES BY PROGRAMS
INLAND EMPIRE

Program	Number of Effective Man-Days	Expenditures According to Fund		Effective Man-Day Cost
Planning, Coordi- nation and Tech- nical Direction		EQ-Reg.	\$ 22,599.08	
FS-Reg.	52,461	FS-Reg.	437,795.61	\$ 8.35
FS-ERA	524	FS-ERA	5,421.00	10.35
Cooperative	7,116	State of Idaho	7,542.73	6.00
		Timber Prot. Assoc.	15,756.40	
		EQ-Reg.	12,593.78	
		EQ-Reg.-Coop.	6,810.78	
		Total	42,703.69	
EQ-ERA	8,209	EQ-ERA	62,817.39	7.83
		EQ-Reg.	1,456.68	
		Total	64,274.57	
CCC	8,096	FS-Reg.	3,020.87	CCC Funds Not Included
Pine Disease Survey	427	FS-Reg.	3,917.52	11.88
		EQ-ERA	1,153.69	
		Total	5,071.21	
Canker Elimination	2,797	FS-Reg.	280.00	5.67
		EQ-ERA	15,568.17	
		Total	15,848.17	
EQ-ERA Winter Project		EQ-ERA	20,564.37	
Total Cost of 1941 Program			\$617,293.57	

	<u>Forest Service</u>	<u>Bureau</u>
Number of meals served	304,800	94,109
Average cost per meal	\$0.234	\$0.204
Pounds twine used	13,709	4,992
Pounds chemical used	15,360	605

SUMMARY OF RIBES ERADICATION, 1941
INLAND EMPIRE

TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Total Gallons Spray
Open Reproduction	14,360	26,334	7,964	48,658	57,004	6,581,272	
Dense Reproduction	47	939	110	1,096	507	89,832	
Open Pole	2,821	4,627	719	8,167	3,881	279,511	
Dense Pole	502	527	25	1,054	117	2,787	
Open Mature	587	865	219	1,671	1,301	156,538	
Cutover	804	3,357	1,504	5,665	6,616	780,140	
Brush	718	48	57	823	289	18,795	
Burn		348		348	751	233,398	
All Upland	19,839	37,045	10,598	67,482	70,466	8,142,273	
Stream (Hand)	326	1,285	645	2,256	5,290	506,424	
Stream (Chemical)	20	427	125	572	875	48,756	16,252
All Stream	326	1,285	645	2,256	6,165	555,180	
All Types	20,165	38,330	11,243	69,738	76,631	8,697,453	

TABLE 3A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis		
					Man- Days	Ribes	Gallons Spray
Open Reproduction	14,360	17,038	3,145,752		1.19	219	
Dense Reproduction	47	50	3,668		1.06	78	
Open Pole	2,821	898	103,964		.32	37	
Dense Pole	502	2	197		.01	1	
Open Mature	587	207	25,316		.35	43	
Cutover	804	1,075	204,130		1.34	254	
Brush	718	149	9,744		.21	14	
All Upland	19,839	19,419	3,492,771		.98	176	
Stream (Hand)	326	1,972	233,474		6.05	716	
Stream (Chemical)	20	78	2,025	675	3.90	101	34
All Stream	326	2,050	235,499		6.29	722	
All Types	20,165	21,469	3,728,270		1.06	185	

TABLE 3B - SECOND WORKING

Open Reproduction	26,334	29,523	2,531,244		1.12	96	
Dense Reproduction	939	382	11,313		.41	12	
Open Pole	4,627	2,495	110,593		.54	24	
Dense Pole	527	98	2,158		.19	4	
Open Mature	865	680	68,256		.79	79	
Cutover	3,357	3,596	392,357		1.07	117	
Brush	48	100	8,056		2.08	168	
Burn	348	751	233,398		2.16	671	
All Upland	37,045	37,625	3,357,375		1.02	91	
Stream (Hand)	1,285	2,275	221,807		1.77	173	
Stream (Chemical)	427	544	27,939	9,313	1.27	65	22
All Stream	1,285	2,819	249,746		2.19	194	
All Types	38,330	40,444	3,607,121		1.06	94	

TABLE 3C - THIRD WORKING

Open Reproduction	7,964	10,443	904,276		1.31	114	
Dense Reproduction	110	75	74,851		.68	680	
Open Pole	719	488	64,954		.68	90	
Dense Pole	25	17	432		.68	17	
Open Mature	219	414	62,966		1.89	288	
Cutover	1,504	1,945	183,653		1.29	122	
Brush	57	40	995		.70	17	
All Upland	10,598	13,422	1,292,127		1.27	122	
Stream (Hand)	645	1,043	51,143		1.62	79	
Stream (Chemical)	125	253	18,792	6,264	2.02	150	50
All Stream	645	1,296	69,935		2.01	108	
All Types	11,243	14,718	1,362,062		1.31	121	

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941
INLAND EMPIRE

State	Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis Man-Days	Ribes
Idaho	First	EQ-ERA	1,019	1,274	198,446		1.25	195
		FS-Reg.	10,107	14,020	2,446,432		1.39	242
		F-CCC	550	2,321	161,442	675	4.22	294
		Total	11,676	17,615	2,806,320	675	1.51	240
	Second	EQ-ERA	2,298	2,756	192,974		1.20	84
		FS-Reg.	22,247	24,257	1,943,024	5,749	1.09	87
		EQ-Coop.	5,438	4,572	274,306	405	.84	50
		F-CCC	693	1,628	92,418	3,159	2.35	133
		S-CCC	1,018	1,568	134,231		1.54	132
		Total	31,694	34,781	2,636,953	9,313	1.10	83
	Third	EQ-ERA	2,334	3,069	248,175		1.31	106
		FS-Reg.	4,674	6,773	344,000	2,719	1.45	74
		EQ-Coop.	2,227	2,544	450,766		1.14	202
		F-CCC	279	966	86,299		3.46	309
		S-CCC	10	18	1,410		1.80	141
	All Workings	Total	9,524	13,370	1,130,650	2,719	1.40	119
		EQ-ERA	5,651	7,099	639,595		1.26	113
		FS-Reg.	37,028	45,050	4,733,456	8,468	1.22	128
		EQ-Coop.	7,665	7,116	725,072	405	.93	95
		F-CCC	1,522	4,915	340,159	3,834	3.23	223
		S-CCC	1,028	1,586	135,641		1.54	132
		Total	52,894	65,766	6,573,923	12,707	1.24	124
Washington	First	FS-Reg.	3,970	1,185	591,104		.30	149
		EQ-ERA	303	212	26,105		.70	86
	Second	FS-Reg.	4,253	2,311	643,091		.54	151
		Total	4,556	2,523	669,196		.55	147
	Third	EQ-ERA	779	898	143,220		1.15	184
		FS-Reg.	633	216	75,265		.34	119
	All Workings	Total	1,412	1,114	218,485		.79	155
		EQ-ERA	1,082	1,110	169,325		1.03	156
		FS-Reg.	8,856	3,712	1,309,460		.42	148
		Total	9,938	4,822	1,478,785		.49	149
Montana	First	FS-ERA	537	516	90,551		.96	169
		FS-Reg.	3,868	1,827	207,217		.47	54
		F-CCC	114	326	33,078		2.86	290
		Total	4,519	2,669	330,846		.59	73
		FS-ERA	20	8	1,289		.40	64
	Second	FS-Reg.	1,784	2,046	189,719		1.15	106
		F-CCC	276	1,086	109,964		3.93	398
		Total	2,060	3,140	300,972		1.51	145
		FS-Reg.	282	51	1,213		.18	4
	Third	F-CCC	25	183	11,714	3,545	7.32	469
		Total	307	234	12,927	3,545	.76	42
		FS-ERA	557	524	91,840		.94	165
	All Workings	FS-Reg.	5,934	3,924	398,149		.66	67
		F-CCC	415	1,595	154,756	3,545	3.84	373
		Total	6,906	6,043	644,745	3,545	.88	93
Total	First	EQ-ERA	1,019	1,274	198,446		1.25	195
		FS-ERA	537	516	90,551		.96	169
		FS-Reg.	17,945	17,032	3,244,753		.95	181
		F-CCC	664	2,647	194,520	675	3.99	293
		Total	20,165	21,469	3,728,270	675	1.06	185
	Second	EQ-ERA	2,601	2,968	219,079		1.14	84
		FS-ERA	20	8	1,289		.40	64
		FS-Reg.	28,284	28,614	2,775,834	5,749	1.01	98
		EQ-Coop.	5,438	4,572	274,306	405	.84	50
		F-CCC	969	2,714	202,382	3,159	2.80	209
		S-CCC	1,018	1,568	134,231		1.54	132
		Total	38,330	40,444	3,607,121	9,313	1.06	94
	Third	EQ-ERA	3,113	3,967	391,395		1.27	126
		FS-Reg.	5,589	7,040	420,478	2,719	1.26	75
		EQ-Coop.	2,227	2,544	450,766		1.14	202
		F-CCC	304	1,149	98,013	3,545	3.78	322
		S-CCC	10	18	1,410		1.80	141
		Total	11,243	14,718	1,362,062	6,264	1.31	121
	All Workings	EQ-ERA	6,733	8,209	808,920		1.22	120
		FS-ERA	557	524	91,840		.94	165
		FS-Reg.	51,818	52,686	6,441,065	8,468	1.02	124
		EQ-Coop.	7,665	7,116	725,072	405	.93	95
		F-CCC	1,937	6,510	494,915	7,379	3.36	256
		S-CCC	1,028	1,586	135,641		1.54	132
		Total	69,738	76,631	8,697,453	16,252	1.10	125

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941
INLAND EMPIRE

State	Working	Number of Acres Worked															Total
		By Forest Service					By Bureau of Entomology and Plant Quarantine					Total					
		Federal			State	Private	Federal			State	Private	Federal			State	Private	
		Forest Service	Public Domain	Total			Forest Service	Public Domain	Total			Forest Service	Public Domain	Total			
Idaho	First	9,792		9,792	335	530	230		230		789	10,022		10,022	335	1,319	11,676
	Second	18,590	200	18,790	1,105	3,056	1,453	133	1,586	2,283	4,874	20,043	333	20,376	3,398	7,930	31,694
	Third	2,671		2,671	618	1,666	360		360	2,803	1,406	3,031		3,031	3,421	3,072	9,524
	Total	31,053	200	31,253	2,058	5,252	2,043	133	2,176	5,086	7,069	33,096	333	33,429	7,144	12,321	52,894
Washington	First	3,970		3,970								3,970		3,970			3,970
	Second	4,210		4,210		43					303	4,210		4,210		346	4,556
	Third	633		633							779	633		633		779	1,412
	Total	8,813		8,813		43					1,082	8,813		8,813		1,125	9,938
Montana	First	3,390		3,390		1,129						3,390		3,390		1,129	4,519
	Second	2,071		2,071		9						2,071		2,071		9	2,080
	Third	123		123		184						123		123		184	307
	Total	5,584		5,584		1,322						5,584		5,584		1,322	6,906
Total	First	17,152		17,152	335	1,659	230		230		789	17,382		17,382	335	2,448	20,165
	Second	24,871	200	25,071	1,105	3,108	1,453	133	1,586	2,283	5,177	26,324	333	26,657	3,398	8,285	39,330
	Third	3,427		3,427	618	1,850	360		360	2,803	2,185	3,787		3,787	3,421	4,035	11,243
	Total	45,450	200	45,650	2,058	6,617	2,043	133	2,176	5,086	8,151	47,493	333	47,826	7,144	14,768	69,723

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
INLAND EMPIRE

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Open Reproduction	14,360	1,427,338	1,705,644	115	12,203	452		3,145,752
	Dense Reproduction	47	709	2,941		18			3,668
	Open Pole	2,821	69,549	34,415					103,964
	Dense Pole	502	125	72					197
	Open Mature	587	15,924	5,600			2,792		25,316
	Cutover	804	140,238	63,892					204,130
	Brush	718	707	9,037					9,744
	All Upland	19,839	1,654,590	1,822,601	115	12,221	3,244		3,492,771
	Stream	326	186,143	13,993	2,025	33,338			235,499
	All Types	20,165	1,840,733	1,836,594	2,140	45,559	3,244		3,728,270
	Open Reproduction	26,334	974,139	1,533,253	3,697	13,359	6,796		2,531,244
Second	Dense Reproduction	939	8,773	2,526	14				11,313
	Open Pole	4,627	57,763	47,447	400	4,979	4		110,593
	Dense Pole	527	962	1,196					2,158
	Open Mature	865	44,005	14,840	460		8,951		68,256
	Cutover	3,357	127,763	251,747	10,743	1,882	222		392,357
	Brush	48	71	7,985					8,056
	Burn	348	175,977	57,421					233,398
	All Upland	37,045	1,399,453	1,916,415	15,314	20,220	15,973		3,357,375
	Stream	1,255	190,381	7,066	29,294	22,347	558		249,746
	All Types	38,300	1,579,834	1,923,481	44,608	42,567	16,631		3,607,121
	Open Reproduction	7,964	243,371	653,227	258	7,406	14		904,276
Third	Dense Reproduction	110	1,326	73,525					74,851
	Open Pole	719	15,241	49,639	21	53			64,954
	Dense Pole	25	133	299					432
	Open Mature	219	45,059	16,171	8		1,728		62,966
	Cutover	1,504	52,123	123,324	384	7,822			183,653
	Brush	57	387	608					995
	All Upland	10,598	357,490	916,722	67	15,281	1,742		1,292,127
	Stream	645	43,429	2,794	13,145	3,477		7,090	69,935
	All Types	11,243	401,069	919,587	13,816	18,758	1,742	7,090	1,362,062
	Open Reproduction	48,658	2,644,848	3,892,124	4,070	32,968	7,262		6,581,272
	Dense Reproduction	1,096	10,808	78,992	14	18			89,832
All Workings	Open Pole	8,167	142,553	131,501	421	5,032	4		279,511
	Dense Pole	1,054	1,220	1,567					2,787
	Open Mature	1,671	104,988	37,611	468		13,471		156,538
	Cutover	5,665	320,124	438,963	11,127	9,704	222		780,140
	Brush	823	1,165	17,630					18,795
	Burn	348	175,977	57,421					233,398
	All Upland	67,482	3,401,683	4,655,809	16,100	47,722	20,959		8,142,273
	Stream	2,256	419,953	23,853	44,464	59,162	558	7,090	555,180
	All Types	69,738	3,821,636	4,679,662	60,564	106,884	21,617	7,090	8,697,453

SUMMARY OF RIBES ERADICATION, 1923-1941
INLAND EMPIRE

TABLE 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray
Open Reproduction	489,660	139,038	18,015	646,713	802,265	193,523,972	
Dense Reproduction	93,523	8,824	233	102,580	47,347	6,727,951	
Open Pole	282,899	57,385	3,586	343,870	169,420	28,960,006	
Dense Pole	71,638	7,861	226	79,725	18,371	2,730,989	
Open Mature	653,257	41,352	2,258	696,867	328,516	69,733,250	
Dense Mature	69,024	1,952		70,976	8,786	1,187,649	
Cutover	49,317	43,186	10,430	102,933	112,559	31,927,030	
Brush	25,041	2,262	344	27,647	27,004	5,103,636	
Burn	10,135	937		11,072	8,785	4,174,390	
Subalpine	3,255	231	88	3,574	2,351	479,573	
Meadow-Field	2,569	10		2,579	152	12,203	
All Upland	1,750,318	303,034	35,180	2,088,536	1,525,556	344,560,649	
Stream (Hand)	118,431	46,647	11,670	176,748	294,007	68,922,284	
Stream (Chemical)	22,538	9,119	1,116	32,773	67,763	5,364,248	1,757,211
Stream (Slash)	1,578	53	40	1,671	19,489	1,008,814	
Stream (Machine)	2,150	102		2,252	12,799	1,222,576	
Stream (Zone)	208	4,143		4,351	3,268	507,427	
All Stream	122,322	50,945	11,670	184,937	397,326	77,025,349	
All Types	1,872,640	353,983	46,850	2,273,473	1,922,882	421,585,998	

TABLE 7A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis		
					Man- Days	Ribes	Gallons Spray
Open Reproduction	489,660	607,204	172,029,968		1.24	351	
Dense Reproduction	93,523	40,957	6,079,329		.44	65	
Open Pole	282,899	133,530	25,089,699		.47	89	
Dense Pole	71,638	15,268	2,404,388		.21	34	
Open Mature	653,257	299,630	66,100,496		.46	101	
Dense Mature	69,024	8,108	1,114,253		.12	16	
Cutover	49,317	48,117	16,558,910		.98	336	
Brush	25,041	24,565	4,856,832		.98	194	
Burn	10,135	7,171	3,414,938		.71	337	
Subalpine	3,255	2,170	463,787		.67	142	
Meadow-Field	2,569	151	12,131		.06	5	
All Upland	1,750,318	1,186,871	298,124,731		.68	170	
Stream (Hand)	118,431	218,257	56,684,563		1.84	479	
Stream (Chemical)	22,538	53,695	4,575,453	1,494,216	2.38	203	66
Stream (Slash)	1,578	18,051	971,517		11.44	616	
Stream (Machine)	2,150	12,341	1,176,076		5.74	547	
Stream (Zone)	208	270	55,658		1.30	268	
All Stream	122,322	302,614	63,463,267		2.47	519	
All Types	1,872,640	1,489,485	361,587,998		.80	193	

TABLE 7B - SECOND WORKING

Open Reproduction	139,038	172,159	19,563,126		1.24	141	
Dense Reproduction	8,824	6,150	543,223		.70	62	
Open Pole	57,385	33,287	3,526,985		.58	61	
Dense Pole	7,861	2,975	320,120		.38	41	
Open Mature	41,352	27,354	3,428,914		.66	83	
Dense Mature	1,952	678	73,396		.35	38	
Cutover	43,186	50,899	13,876,847		1.18	321	
Brush	2,262	2,213	227,898		.98	101	
Burn	937	1,614	759,452		1.72	811	
Subalpine	231	142	10,438		.61	45	
Meadow-Field	10	1	72		.10	7	
All Upland	303,034	297,472	48,330,471		.98	140	
Stream (Hand)	46,647	61,143	10,265,986		1.31	220	
Stream (Chemical)	9,119	13,061	720,374	240,188	1.43	79	26
Stream (Slash)	53	796	17,294		15.02	326	
Stream (Machine)	102	458	46,500		4.49	456	
Stream (Zone)	4,143	2,998	451,769		.72	109	
All Stream	50,945	78,456	11,501,923		1.54	224	
All Types	353,983	375,928	53,832,394		1.06	152	

TABLE 7C - THIRD WORKING

Open Reproduction	18,015	22,902	1,930,878		1.27	107	
Dense Reproduction	233	240	105,399		1.03	452	
Open Pole	3,586	2,603	343,322		.73	96	
Dense Pole	226	128	6,481		.57	29	
Open Mature	2,258	1,532	203,840		.68	90	
Cutover	10,430	13,543	1,491,273		1.30	143	
Brush	344	226	18,906		.66	55	
Subalpine	88	39	5,348		.44	61	
All Upland	35,180	41,213	4,105,447		1.17	117	
Stream (Hand)	11,670	14,607	1,971,738		1.25	159	
Stream (Chemical)	1,116	1,007	68,421	22,807	.90	61	20
Stream (Slash)	40	642	20,000		16.05	500	
All Stream	11,670	16,256	2,060,159		1.39	177	
All Types	46,850	57,469	6,165,606		1.23	132	

TABLE 3
SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1941
INLAND EMPIRE

State	Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis Man-Days Ribes
Idaho	First	Eq-Reg.	44,572	15,195	3,913,072		.54 89
		FS-Reg.	149,298	166,346	45,539,899	290,205	1.12 294
		Eq-NIRA	61,376	37,916	15,414,572	24,200	.62 219
		FS-NIRA	270,392	160,637	47,282,390	113,170	.59 175
		Eq-ERA	336,578	252,612	64,080,774	129,299	.75 190
		FS-ERA	34,628	34,208	6,859,911		.99 199
		Eq-Coop.	219,676	104,078	30,882,002	339,769	.47 141
		F-CCC	350,293	413,252	83,244,456	316,417	1.18 236
		SMP-CCC	166,813	127,659	26,122,385	234,341	.77 156
		Total	1,632,335	1,311,303	319,359,441	1,436,391	.80 192
	Second	FS-Reg.	105,273	107,133	13,690,025	49,111	1.02 130
		Eq-NIRA	2,818	1,888	451,021	3,355	.67 160
		FS-NIRA	16,342	7,262	966,499	6,007	.44 59
		Eq-ERA	101,714	96,915	17,418,364	52,956	.95 171
		FS-ERA	14,822	12,817	1,331,696	2,044	.86 90
		Eq-Coop.	14,996	11,013	1,266,100	13,632	.73 84
		F-CCC	48,815	85,412	8,408,051	50,451	1.75 172
		SMP-CCC	16,301	20,998	4,644,629	51,086	1.29 295
		Total	321,102	343,459	49,175,405	227,642	1.07 150
	Third	FS-Reg.	14,525	17,252	1,692,582	6,849	1.19 117
		FS-NIRA	914	747	127,700	1,922	.82 140
		Eq-ERA	12,427	14,769	1,509,738	5,135	1.19 121
		FS-ERA	771	569	68,599	348	.74 89
		Eq-Coop.	2,551	2,616	457,858		1.03 179
		F-CCC	7,335	13,437	1,141,601	5,008	1.83 156
		SMP-CCC	856	935	168,088		1.09 136
		Total	39,379	50,325	5,166,166	19,262	1.28 131
	All Workings	Eq-Reg.	44,572	15,195	3,913,072		.54 89
		FS-Reg.	268,006	290,751	58,922,416	335,165	1.08 220
		Eq-NIRA	64,193	39,804	13,865,693	27,555	.62 216
		FS-NIRA	287,648	168,646	48,376,579	123,099	.59 168
		Eq-ERA	450,749	364,296	85,008,876	186,390	.81 184
		FS-ERA	50,221	47,594	9,260,195	2,332	.72 112
		Eq-Coop.	237,213	117,707	32,605,960	353,401	.50 137
		F-CCC	406,444	512,101	92,794,138	371,876	1.26 228
		SMP-CCC	183,970	149,592	30,935,102	285,427	.81 168
		Total	1,993,016	1,705,686	372,682,032	1,685,295	.86 187
Washington	First	FS-Reg.	12,564	11,265	4,691,868		.90 373
		Eq-NIRA	26,735	11,711	4,348,259		.44 163
		FS-NIRA	34,117	12,708	3,898,496		.37 112
		Eq-ERA	21,423	35,181	10,074,443		1.64 470
		F-CCC	19,741	21,426	3,254,404		1.09 165
		Total	114,878	92,291	26,227,469		.80 228
	Second	FS-Reg.	8,032	4,549	1,360,710		.56 168
		Eq-ERA	11,920	12,212	2,634,166		1.02 221
		FS-ERA	1,949	1,678	154,764		.86 79
		F-CCC	2,597	3,279	232,852		1.27 90
		Total	24,538	21,718	4,396,469		.99 179
	Third	FS-Reg.	433	216	75,265		.34 119
		Eq-ERA	4,691	4,036	768,915		.86 164
		Total	5,114	4,252	844,180		.90 159
	All Workings	FS-Reg.	21,279	16,030	6,127,843		.75 288
		Eq-NIRA	26,735	11,711	4,348,259		.44 163
		FS-NIRA	34,417	12,708	3,898,496		.37 112
		Eq-ERA	38,024	51,429	13,477,524		1.35 354
		FS-ERA	1,949	1,678	154,764		.86 79
		F-CCC	22,328	24,705	3,487,233		1.11 156
		Total	144,780	118,261	31,454,118		.82 217
	First	Eq-Reg.	1,383	2,315	462,300	30,665	1.67 334
		FS-Reg.	12,524	11,392	1,653,529	2,452	.91 132
		Eq-NIRA	21,773	8,027	2,108,067		.37 99
		FS-NIRA	22,215	16,789	4,684,242	10,417	.76 211
		Eq-ERA	42,313	20,886	3,292,671	1,330	.49 78
		FS-ERA	11,247	16,299	2,473,391	10,181	1.45 220
		F-CCC	13,772	10,083	1,296,868	2,780	.73 94
		Total	125,227	85,291	16,021,069	57,825	.68 128
	Second	Eq-Reg.	619	980	299,410	4,130	1.58 494
		FS-Reg.	3,604	3,537	341,025	5,376	.98 95
		Eq-ERA	1,342	1,597	285,637		1.19 198
		FS-ERA	2,100	2,464	294,021	1,040	1.17 97
		F-CCC	678	2,174	163,467		3.21 241
		Total	8,343	10,752	1,273,520	10,546	1.29 153
	Third	FS-Reg.	1,334	1,864	78,437		1.40 59
		Eq-ERA	648	777	59,040		1.20 91
		FS-ERA	150	68	6,069		.45 40
		F-CCC	25	188	11,714	3,545	7.32 469
		Total	2,157	2,892	155,263	3,545	1.84 72
	All Workings	Eq-Reg.	2,002	3,295	761,710	34,795	1.65 380
		FS-Reg.	17,462	16,793	2,072,991	7,828	.96 119
		Eq-NIRA	21,773	8,027	2,108,067		.37 99
		FS-NIRA	22,215	16,789	4,684,242	10,417	.76 211
		Eq-ERA	44,303	22,760	3,617,348	1,350	.51 82
		FS-ERA	13,497	18,931	2,685,481	11,221	1.40 199
		F-CCC	14,475	12,440	1,472,009	9,325	.87 122
		Total	135,727	98,335	17,449,848	71,916	.73 123
Idaho Washington Montana	First	Eq-Reg.	45,955	17,510	4,375,372	30,665	.38 95
		FS-Reg.	173,296	189,003	49,895,206	282,657	1.09 288
		Eq-NIRA	109,881	57,654	19,920,997	24,200	.52 181
		FS-NIRA	327,024	190,134	55,825,118	123,587	.58 171
		Eq-ERA	400,314	308,179	77,447,898	129,619	.77 193
		FS-ERA	45,875	50,507	9,333,302	10,181	1.10 203
		Eq-Coop.	219,676	104,078	30,882,002	339,769	.47 141
		F-CCC	383,806	444,761	87,795,728	319,197	1.16 229
		SMP-CCC	166,813	127,659	26,122,385	234,341	.77 156
		Total	1,872,640	1,489,485	361,587,998	1,494,216	.80 193
	Second	Eq-Reg.	619	980	299,410	4,130	1.58 494
		FS-Reg.	116,959	115,239	15,391,760	53,487	.99 132
		Eq-NIRA	2,818	1,888	451,021	3,355	.67 160
		FS-NIRA	16,342	7,262	966,499	6,007	.44 59
		Eq-ERA	115,006	110,724	20,318,167	52,956	.96 177
		FS-ERA	18,871	16,959	1,690,471	3,084	.90 90
		Eq-Coop.	14,966	11,013	1,266,100	13,632	.73 84
		F-CCC	52,081	90,865	8,904,337	50,451	1.74 169
		SMP-CCC	16,301	20,998	4,644,629	51,086	1.29 295
		Total	353,983	375,928	53,832,394	240,188	1.05 152
	Third	FS-Reg.	16,424	19,332	1,946,294	6,849	1.17 112
		Eq-NIRA	914	747	127,700	1,922	.82 140
		FS-ERA	17,756	19,582	2,337,693	5,135	1.10 132
		FS-ERA	921	637	74,668	348	.69 81
		Eq-Coop.	2,551	2,616	457,858		1.03 179
		F-CCC	7,360	13,620	1,153,315	8,553	1.85 157
		SMP-CCC	856	935	168,088		1.09 136
		Total	46,850	57,469	6,155,606	22,807	1.23 159
	All Workings	Eq-Reg.	45,954	19,490	4,674,782	34,795	1.00 100
		FS-Reg.	306,747	353,574	67,123,250	342,993	1.05 219
		Eq-NIRA	112,699	59,542	20,372,018	27,555	.53 181
		FS-NIRA	344,290	198,143	56,919,317	133,516	.58 165
		Eq-ERA	533,076	438,495	100,103,749	187,710	.82 188
		FS-ERA	65,667	68,103	11,096,441	13,613	1.04 169
		Eq-Coop.	237,213	117,707	32,605,960	353,401	.50 137
		F-CCC	443,247	549,245	97,735,390	378,221	1.24 221
		SMP-CCC	193,970	149,592	30,935,102	285,427	.81 168
		Total	2,275,473	1,922,882	421,585,998	1,757,211	.85 185

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1941
INLAND EMPIRE

State	Working	Number of Acres Worked by Ownership Classes					Total
		Federal			State	Private	
		Forest Service	Public Domain	Total			
Idaho	First	862,699	16,482	879,181	263,749	489,605	1,632,535
	Second	180,545	5,325	185,870	42,966	92,266	321,102
	Third	19,404	142	19,546	7,244	12,589	39,379
	Total	1,062,648	21,949	1,084,597	313,959	594,460	1,993,016
Washington	First	68,053	315	68,368	6,832	39,678	114,878
	Second	12,950	60	13,010	3,935	7,593	24,538
	Third	633		633	2,114	2,567	5,314
	Total	81,636	375	82,011	12,881	49,838	144,730
Montana	First	103,396		103,396	696	21,135	125,227
	Second	6,376		6,376		1,967	8,343
	Third	897		897		1,260	2,157
	Total	110,669		110,669	696	24,362	135,727
Total	First	1,034,148	16,797	1,050,945	271,277	550,418	1,872,640
	Second	199,871	5,385	205,256	46,901	101,826	353,983
	Third	20,934	142	21,076	9,358	16,416	46,850
	Total	1,254,953	22,324	1,277,277	327,536	668,660	2,273,473

TABLE 10

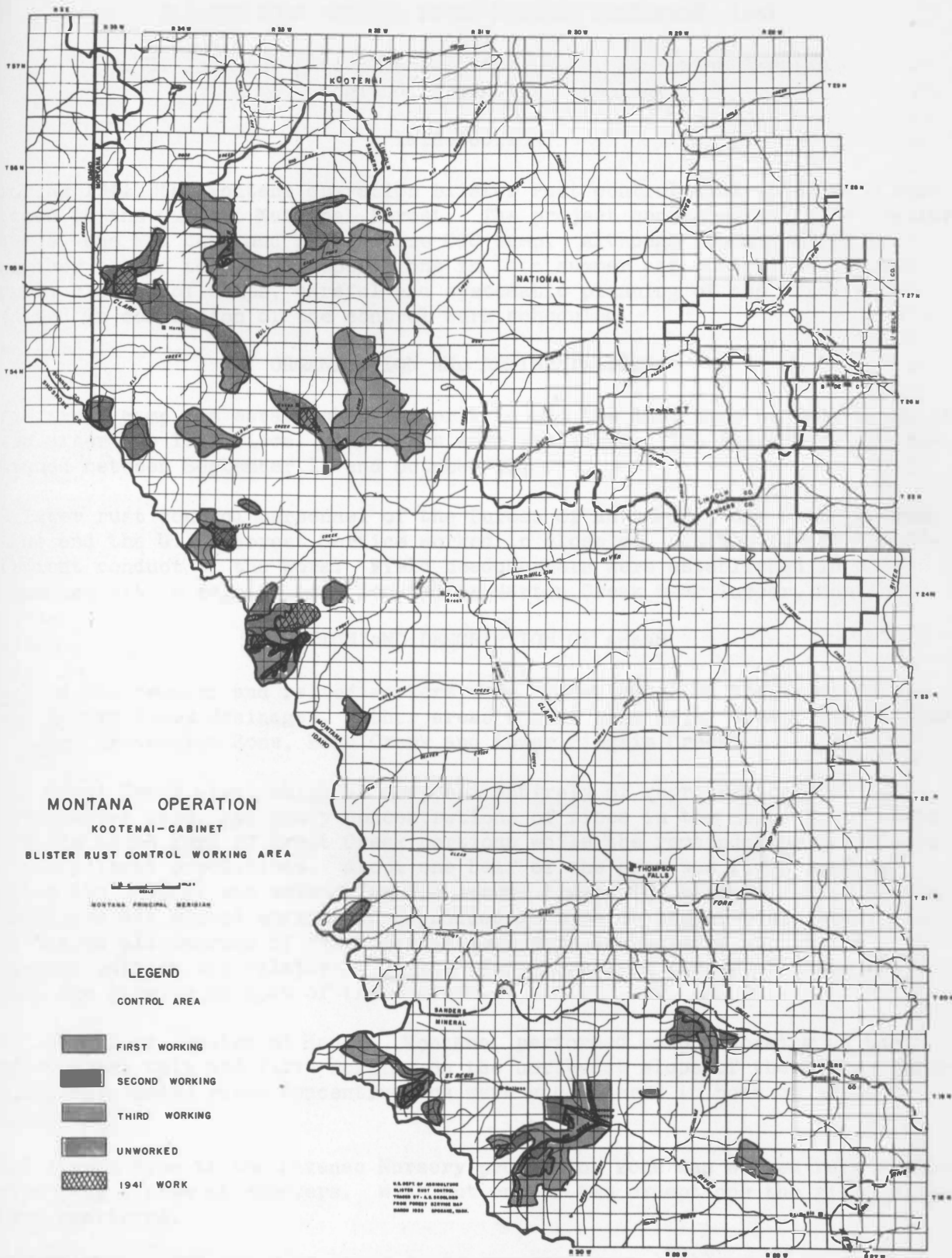
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1941
INLAND EMPIRE

State	Ownership Class	Number of Acres			Acres Mature Stands on Which Working Is Deferred	Total Acres White Pine
		Worked	Unworked	Total		
Idaho	Forest Service	862,699	210,937	1,073,636	56,454	1,130,090
	Public Domain	16,482	14,068	30,550	1,040	31,590
	Subtotal Federal	879,181	225,005	1,104,186	57,494	1,161,680
	State	263,749	49,091	312,840	32,110	344,950
	Private	489,605	215,488	705,093	95,932	801,025
	Total	1,632,535	489,584	2,122,119	185,536	2,307,655
Washington	Forest Service	68,053	31,257	99,310		99,310
	Public Domain	315		315		315
	Subtotal Federal	68,368	31,257	99,625		99,625
	State	6,832	3,018	9,850		9,850
	Private	39,678	11,942	51,620		51,620
	Total	114,878	46,217	161,095		161,095
Montana	Forest Service	103,396	46,423	149,819	13,706	163,525
	State	696	234	930		930
	Private	21,135	12,660	33,795	2,490	36,285
	Total	125,227	59,317	184,544	16,196	200,740
Total	Forest Service	1,034,148	288,617	1,322,765	70,160	1,392,925
	Public Domain	16,797	14,068	30,865	1,040	31,905
	Subtotal Federal	1,050,945	302,685	1,353,630	71,200	1,424,830
	State	271,277	52,343	323,620	32,110	355,730
	Private	550,418	240,090	790,508	98,422	888,930
	Total	1,872,640	595,118	2,467,758	201,732	2,669,490

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1923-1941
INLAND EMPIRE

Working	Eradication Type	Acres	Ribes by Species								Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes coloradense	Ribes triste	Ribes acerifolium	
First	Open Reproduction	489,660	46,033,623	124,259,898	180,707	1,083,653	469,766	1,176	1,145		172,029,968
	Dense Reproduction	93,523	3,159,762	2,762,059	15,767	104,649	34,813	2,279			6,079,329
	Open Pole	282,899	12,549,907	11,899,122	63,582	349,667	223,045		462	3,914	25,089,699
	Dense Pole	71,638	1,471,792	884,224	1,651	36,301	10,420				2,404,388
	Open Mature	653,257	43,065,928	21,964,261	225,205	363,002	472,978	7,069	26	2,027	66,100,496
	Dense Mature	69,024	818,347	249,393	1,104	42,382	2,839	188			1,114,253
	Cutover	49,317	5,868,511	10,517,398	43,873	90,333	38,795				16,558,910
	Brush	25,041	1,522,994	3,196,630	19,257	97,116	20,835				4,856,832
	Burn	10,135	706,582	2,671,736	8,895	18,433	9,292				3,414,938
	Subalpine	3,255	326,851	136,917		19					463,787
	Meadow-Field	2,569	5,010			7,121					12,131
	All Upland	1,750,318	115,529,307	178,541,638	560,041	2,192,676	1,282,783	10,712	1,533	5,941	298,124,731
	Stream	122,322	41,914,780	2,004,363	5,312,452	13,042,708	116,220	31,905	21,255	19,584	63,463,267
	All Types	1,872,640	157,444,087	180,546,001	6,872,493	15,235,384	1,399,003	42,617	22,888	25,525	361,587,998
Second	Open Reproduction	139,038	6,613,264	12,768,255	51,492	96,492	31,032		2,591		19,563,126
	Dense Reproduction	8,824	369,515	171,980	18	1,627	83				543,223
	Open Pole	57,385	1,784,811	1,685,370	19,108	35,956	1,740				3,526,985
	Dense Pole	7,861	239,158	74,241	3,960	2,761					320,120
	Open Mature	41,352	1,845,895	1,515,832	16,546	14,440	35,934		267		3,428,914
	Dense Mature	1,952	59,675	12,838		658	225				73,396
	Cutover	43,186	3,235,585	10,528,593	77,475	24,417	10,777				13,876,847
	Brush	2,262	68,574	158,449		875					227,898
	Burn	937	287,197	466,808	5,447						759,452
	Subalpine	231	5,431	5,007							10,438
	Meadow-Field	10	72								72
	All Upland	303,338	14,509,177	27,587,373	174,046	177,226	79,791		2,858		42,550,471
	Stream	50,245	6,640,441	775,912	1,943,990	1,954,779	32,190		154,711		11,501,923
	All Types	353,583	21,149,618	28,163,185	2,118,036	2,132,005	111,981		157,569		53,832,394
Third	Open Reproduction	18,015	785,968	1,127,758	7,726	9,212	214				1,930,878
	Dense Reproduction	233	26,034	79,365							105,399
	Open Pole	3,586	185,528	157,697	38	53	6				343,322
	Dense Pole	226	5,885	596							6,481
	Open Mature	2,258	149,443	52,661	8		1,728				203,840
	Cutover	10,430	663,601	805,188	14,519	7,822	143				1,491,273
	Brush	344	5,302	13,604							18,906
	Subalpine	88	2,510	2,838							5,348
	All Upland	35,180	1,824,271	2,239,707	22,291	17,087	2,091				4,105,447
	Stream	11,570	1,008,899	30,737	588,598	482,453			9,472		2,060,159
	All Types	46,850	2,833,170	2,270,444	550,889	499,540	2,091		9,472		6,165,606
	Open Reproduction	646,713	53,432,855	138,155,911	239,925	1,189,357	501,012	1,176	3,736		193,523,972
	Dense Reproduction	102,580	3,555,311	3,013,404	15,785	106,276	34,896	2,279			6,727,951
	Open Pole	343,870	14,520,246	13,742,189	82,728	385,676	224,791		462	3,914	28,960,006
All Workings	Dense Pole	79,725	1,716,835	959,061	5,611	39,062	10,420				2,730,989
	Open Mature	696,867	45,061,266	23,532,754	241,759	377,442	510,640	7,069	293	2,027	69,733,250
	Dense Mature	70,976	878,022	262,231	1,104	43,040	3,064	188			1,187,649
	Cutover	102,933	9,767,697	21,851,179	135,867	122,572	49,715				31,927,030
	Brush	27,647	1,596,870	3,368,683	19,257	97,991	20,835				5,103,636
	Burn	11,072	993,779	3,138,544	14,342	18,433	9,292				4,174,390
	Subalpine	3,574	334,792	144,762		19					479,573
	Meadow-Field	2,579	5,082			7,121					12,203
	All Upland	2,088,536	131,862,755	208,168,718	756,378	2,386,989	1,364,665	10,712	4,491	5,941	344,560,649
	Stream	184,937	47,564,120	2,810,912	8,785,040	15,479,940	148,410	31,905	185,438	19,584	77,025,349
	All Types	2,273,473	181,426,875	210,979,630	9,541,418	17,866,929	1,513,075	42,617	189,929	25,525	421,585,998



BLISTER RUST CONTROL WORK, MONTANA OPERATION, 1941

By

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INTRODUCTION

During 1941, the Montana operation blister rust control activities were confined to the Cabinet National Forest. The project consisted of three regular camps, one ERA camp and part of one CCC camp. Although prolonged rainy weather tended to slow up operations in late summer and contributed to the early closing of camps, careful and systematic planning of the efforts resulted in completion of the control work scheduled.

ORGANIZATION AND ADMINISTRATION

The first camp was established on April 14 and the last camp on July 5, which was after the 1942 fiscal year funds were available. The camps were discontinued between September 12 and October 15.

Blister rust control personnel of the Bureau of Entomology and Plant Quarantine and the U. S. Forest Service worked in close cooperation toward the efficient conduct of the work. Field headquarters were established in conjunction with a regular camp located on Marten Creek near Tuscor, Montana.

LOCATION AND DESCRIPTION OF AREAS

All of the regular and relief workers were concentrated on the Trout Creek and Marten Creek drainages. Other areas worked were Rainy Creek, the Savenac Nursery Protection Zone, Blue Creek and lower Pilgrim Creek.

The Trout Creek area, which is composed entirely of reproduction type on burned-over land, had heavy concentrations of ribes in the upper Trout Creek and the South Fork of Trout Creek portions while the remainder supported relatively light populations. About one half of the area was first working while the balance was worked for the second time. The area worked on Marten Creek was all second working in reproduction type on logged-over lands. On this area all degrees of ribes populations were encountered though the greater portion was relatively light. Very excellent stands of young white pine are growing on both of these areas.

CCC enrollees located at Haugan, Montana, performed second working on the Rainy Creek unit and first working on the northeast slope of the Haugan Look-out area. Heavy ribes concentrations were encountered in both of these areas.

The stream type in the Savenac Nursery protection zone was worked very intensively by a crew of checkers. With but one or two exceptions the ribes were very scattered.

The Pilgrim Creek and Blue Creek areas required very little work since the advance survey showed only three or four patches of ribes on the two areas.

METHODS AND EQUIPMENT

Standard grubbing and spraying methods were used throughout the season. Special emphasis was placed on the systematic training of new men which resulted in increased production. In addition the mop-up men were carefully selected and trained in order to increase the effectiveness of their work.

CHECKING AND PINE DISEASE SURVEY

In the spring of 1941 a small amount of infection was found in the planting stock being shipped and the transplant stock being moved from seedbeds. Data on the total amount of this were not obtained but it is known to be a relatively small percentage. A further inspection in August of about 10,000 of the transplants failed to disclose any infection, and some of these inspections were made in the identical beds that previously had contained infected stock.

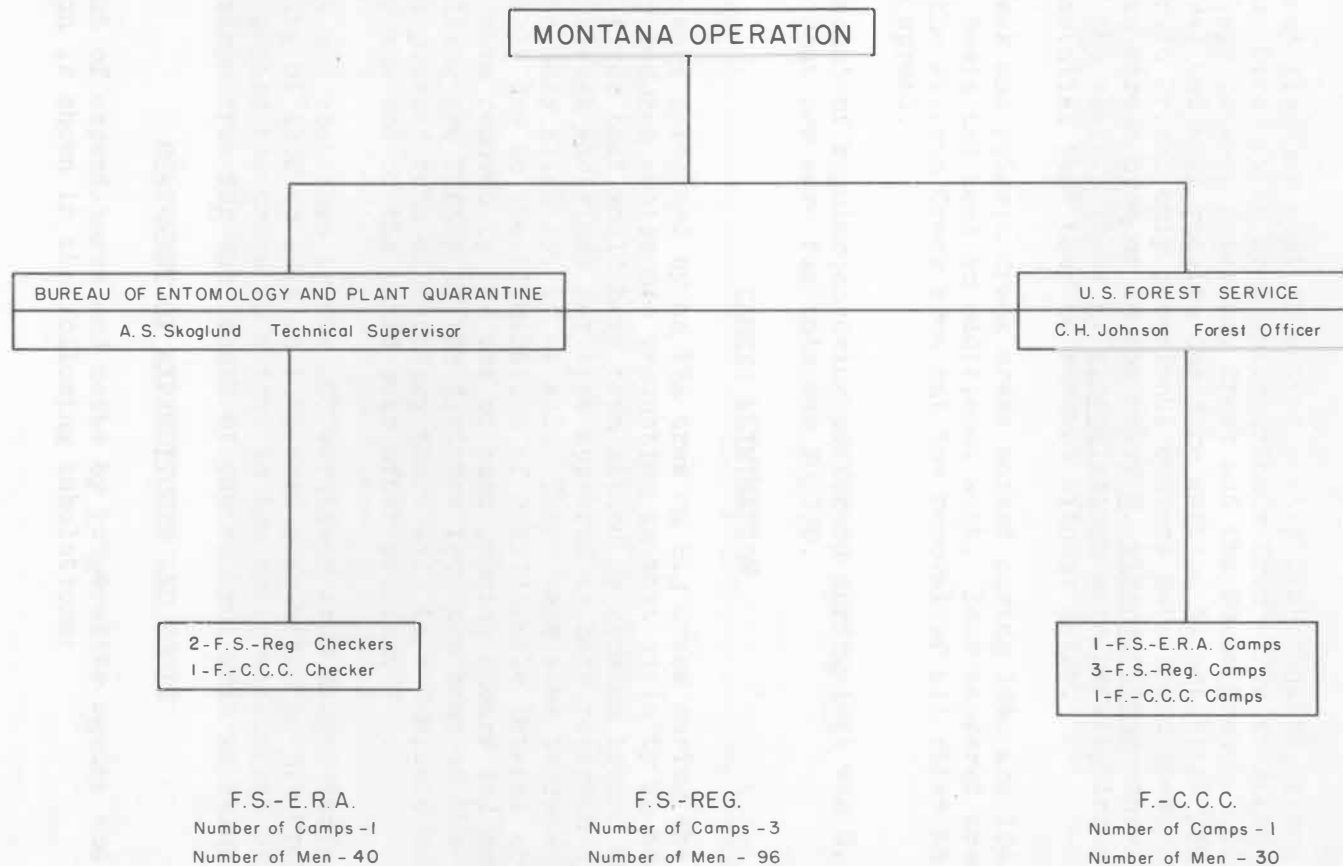
The stream type in the Savenac Nursery protection zone was checked very intensively during 1941 by a crew of three checkers. To secure a satisfactory sample of the very low ribes population remaining in most of the extensive and brushy stream type, considerable searching was done. In addition a careful check was made for the disease on the young native white pine. These trees growing in the stream type adjoining the nursery are practically rust-free, only two cankers having been found.

The upland type in the immediate vicinity of the nursery is generally ribes-free and only occasionally can a canker be found except in the upper part of the old nursery where scattered Pinus albicaulis are encountered. The white pines under Haugan Lookout are about five per cent infected though most of the scattered P. albicaulis are infected. This area which is on the southwest extremity of the nursery protective zone contains approximately 800 Ribes viscosissimum per acre and needs to be worked in a most thorough manner during 1942 in order to prevent a large build-up of infection. This immediate work in addition to further work of several small areas and a small amount of annual maintenance work thereafter should afford satisfactory blister rust protection to the nursery.

The reproduction in the Rainy Creek drainage is badly infected with both branch and trunk cankers. The initial work toward control done in 1934 was ineffective due to the persistence of large quantities of the original masses of R. petiolare and R. triste. As a result heavy infection developed, especially in 1937, until about 20 per cent of the pine has become infected. Fortunately, much of the infection in the upland zone is confined to the branches so pruning, along with ribes eradication, was undertaken. The area is in a damp locality very favorable for the spread of blister rust, but it is also an excellent site for white pine. Additional work is urgent if the fine stand of reproduction is to reach maturity.

In the Marten Creek drainage only isolated and scattered pine infection was found with most of this in the stream zone and damp sites. The build-up of rust should be somewhat slow and if the necessary rework of several remaining small areas is completed, little damage may be expected.

ORGANIZATION CHART



Total Number of Men on Blister Rust Work - 166

No pine infection was found during 1941 in the extensive Trout Creek planted area. The only infection found in this area to date is one canker located in 1940. Several small areas of seedling R. viscosissimum that germinated during planting operations need to be eliminated to put the area in a satisfactory condition.

There is about five per cent infection mostly limb cankers, along the West Fork of Trout Creek in an area which extends from three to eight chains up the south slope between Atterbury Creek and the South Branch. This area was worked in 1941 and will require one more working to establish protection. Above the South Branch only occasional cankers were found these occurring either in the stream type or in the heavy R. viscosissimum concentration at the head of the basin. These R. viscosissimum were heavily infected in 1941 making it essential that they be removed without delay.

The Blue Creek and Pilgrim Creek areas worked during 1940 and 1941 are on a maintenance basis and need no additional work. Four cankered trees were removed from the Pilgrim Creek area but the removal of all ribs should stop any further spread.

The total amount of regular checking performed during 1941 was 5,483 acres. The average cost per acre for this was \$0.078.

CANKER ELIMINATION

The pruning work performed by an ERA crew on Big Creek during the fall of 1940 greatly reduced aeciospore production in that vicinity in addition to saving many trees that would have been killed by growing branch cankers. The several branch excisions per tree appeared to have retarded average height growth only slightly, if at all. There were some increases in height growth possibly due to the elimination of considerable lateral growth. The lower limbs were removed by the use of hand pruning shears and saws to a height equalling two fifths of the distance from the base of the tree to the top. At the present rate of recovery there will be a complete heal-over of all cuts by the end of the third year after pruning.

Pruning work was continued by the CCC enrollees from Haugan during the winter and spring of 1940 to 1941 on a 50-acre plantation on Big Creek. In addition they pruned the trees in a five to ten chain wide strip of stream bottom and slope area for the length of the control unit in Rainy Creek.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs by cooperative agency and type of appropriation is shown in the following tabulations:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941
MONTANA OPERATION

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	\$33,936.00
	ERA	5,421.00
	Total	39,357.00
Bureau of Entomology and Plant Quarantine	Regular	2,945.50
All Agencies	Total	\$42,302.50

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941
MONTANA OPERATION

Item	Forest Service			Bureau of Entomology and Plant Quarantine	
	Regular	ERA	Total	Regular	Total
Sal., perm. men	\$ 3,506.00		\$ 3,506.00	\$2,700.00	\$ 6,206.00
Sal., temp. men	4,733.00	\$ 183.00	4,916.00		4,916.00
Wages, temp. labs.	18,162.00	2,942.00	21,104.00		21,104.00
Subs. supplies	4,586.00	2,004.00	6,590.00		6,590.00
Equipment	1,133.00	161.00	1,294.00		1,294.00
Trucks	696.00	58.00	754.00		754.00
Travel and Transp.	376.00	58.00	434.00	236.20	670.20
Chemicals	332.00		332.00		332.00
Twine	236.00		236.00		236.00
Other supplies	176.00	15.00	191.00	9.30	200.30
Total	\$33,936.00	\$5,421.00	\$39,357.00	\$2,945.50	\$42,302.50

TABLE 2A

DISTRIBUTION OF BLISTER RUST CONTROL EXPENDITURES
BY PROGRAMS
MONTANA OPERATION

Program	Number of Effective Man-Days	Expenditures According to Fund		Effective Man-Day Cost
Planning, Coordination and Technical Direction		EQ-Reg.	\$ 2,945.50	
FS-Reg.	3,924	FS-Reg.	33,936.00	\$ 8.65
FS-ERA	524	FS-ERA	5,421.00	10.35
CCC	1,595	CCC funds not included		
Total Cost of 1941 Program			\$42,302.50	

Number of meals served	26,524	Average cost per meal	\$0.248
Pounds of twine used	460	Pounds of chemical used	5,000

SUMMARY OF RIBES ERADICATION, 1941
MONTANA OPERATION

TABLE 3 - SUMMARY OF ALL WORKINGS

Forest	Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
									Bushes	Live Stem
Cabinet	Open Reproduction	1,962	1,869		3,831	4,606	515,408		5.3	13.6
	Open Pole	1,680			1,680	8	422		0	0
	Brush	718			718	149	9,744		.8	5.5
	All Upland	4,360	1,869		6,229	4,763	525,574		3.9	10.7
	Stream (Hand)	45	211		256	720	73,166		9.3	27.6
	Stream (Chemical)			12	12	148	10,635	3,545		
	All Stream	45	211		256	868	83,801		9.3	27.6
	All Types	4,405	2,080		6,485	5,631	609,375		4.2	11.6
Savenac Nursery	Open Reproduction	114		25	139	361	34,157		2.4	8.5
	Stream (Hand)			282	282	51	1,213			
	All Types	114		307	421	412	35,370		2.4	8.5
All Forests	Open Reproduction	2,076	1,869	25	3,970	4,967	549,565		5.2	13.4
	Open Pole	1,680			1,680	8	422		0	0
	Brush	718			718	149	9,744		.8	5.5
	All Upland	4,474	1,869	25	6,368	5,124	559,731		3.9	10.6
	Stream (Hand)	45	211	282	538	771	74,379		9.3	27.6
	Stream (Chemical)			12	12	148	10,635	3,545		
	All Stream	45	211	282	538	919	85,014		9.3	27.6
	All Types	4,519	2,080	307	6,906	6,043	644,745		4.2	11.4

TABLE 3A - FIRST WORKING

Forest	Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man- Days	Ribes	Gallons Spray	Bushes	Live Stem
Cabinet	Open Reproduction	1,962	2,038	264,131		1.04	135		3.9	9.4
	Open Pole	1,680	8	422		.01	1		0	0
	Brush	718	149	9,744		.21	14		.8	5.5
	All Upland	4,360	2,195	274,297		.50	63		2.7	7.2
	Stream (Hand)	45	148	23,471		3.29	522		9.3	27.6
	All Types	4,405	2,343	297,768		.53	68		3.1	8.5
Savenac Nursery	Open Reproduction	114	326	33,078		2.86	290		2.5	9.8
	Open Reproduction	2,076	2,364	297,209		1.14	143		3.8	9.5
All Forests	Open Pole	1,680	8	422		.01	1		0	0
	Brush	718	149	9,744		.21	14		.8	5.5
	All Upland	4,474	2,521	307,375		.56	69		2.7	7.3
	Stream (Hand)	45	148	23,471		3.29	522		9.3	27.6
	All Types	4,519	2,669	330,846		.59	73		3.1	8.5

TABLE 3B - SECOND WORKING

Cabinet	Open Reproduction	1,869	2,568	251,277		1.37	134		8.6	23.2
	Stream (Hand)	211	572	49,695		2.71	236			
	All Types	2,080	3,140	300,972		1.51	145		8.6	23.2

TABLE 3C - THIRD WORKING

Cabinet	Stream (Chemical)	12	148	10,635	3,545	12.33	886	295		
Savenac Nursery	Open Reproduction	25	35	1,079		1.40	43		2.1	2.1
	Stream (Hand)	282	51	1,213		.18	4			
	All Types	307	86	2,292		.28	7			
All Forests	Open Reproduction	25	35	1,079		1.40	43		2.1	2.1
	Stream (Hand)	282	51	1,213		.18	4			
	Stream (Chemical)	12	148	10,635	3,545	12.33	886	295		
	All Stream	282	199	11,848		.71	42			
	All Types	307	234	12,927		.76	42			

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941
MONTANA OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man- Days	Ribes	Gallons Per Sprayed Area	Bushes	Live Stem
First	FS-ERA	537	516	90,551		.96	169		3.7	7.9
	FS-Reg.	3,868	1,827	207,217		.47	54		2.9	8.6
	F-CCC	114	326	33,078		2.86	290		2.5	9.8
	Total	4,519	2,669	330,846		.59	73		3.1	8.5
Second	FS-ERA	20	8	1,289		.40	64		13.7	20.0
	FS-Reg.	1,784	2,046	189,719		1.15	106		8.6	21.1
	F-CCC	276	1,086	109,964		3.93	398		8.3	29.1
	Total	2,080	3,140	300,972		1.51	145		8.6	23.2
Third	FS-Reg.	282	51	1,213		.18	4			
	F-CCC	25	183	11,714	3,545	7.32	469	295	2.1	2.1
	Total	307	234	12,927	3,545	.76	42	295		
All Workings	FS-ERA	557	524	91,840		.94	165		3.9	8.1
	FS-Reg.	5,934	3,924	398,149		.66	67		4.1	11.1
	F-CCC	415	1,595	154,756	3,545	3.84	373	295	6.2	21.6
	Total	6,906	6,043	644,745	3,545	.88	93	295	4.2	11.4

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941
MONTANA OPERATION

Forest	Working	Number of Acres Worked by Forest Service		
		Forest Service	Private	Total
Cabinet	First	3,276	1,129	4,405
	Second	2,071	9	2,080
	Total	5,347	1,138	6,485
Savenac Nursery	First	114		114
	Third	123	184	307
	Total	237	184	421
All Forests	First	3,390	1,129	4,519
	Second	2,071	9	2,080
	Third	123	184	307
	Total	5,584	1,322	6,906

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
MONTANA OPERATION

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inermis	Ribes irriguum	Ribes triste	
First	Open Reproduction	2,076	145,312	151,897					297,209
	Open Pole	1,680	10	412					422
	Brush	718	707	9,037					9,744
	All Upland	4,474	146,029	161,346					307,375
	Stream	45	21,765	1,706					23,471
	All Types	4,519	167,794	163,052					330,846
Second	Open Reproduction	1,869	216,188	34,994			95		251,277
	Stream	211	46,951	2,078	8		658		49,695
	All Types	2,080	263,139	37,072	8		753		300,972
Third	Open Reproduction	25	178	901					1,079
	Stream	282	73		3,587	1,098		7,090	11,848
	All Types	307	251	901	3,587	1,098		7,090	12,927
All Workings	Open Reproduction	3,970	361,678	187,792			95		549,565
	Open Pole	1,680	10	412					422
	Brush	718	707	9,037					9,744
	All Upland	6,368	362,395	197,241			95		559,731
	Stream	538	68,789	3,784	3,595	1,098	658	7,090	85,014
	All Types	6,906	431,184	201,025	3,595	1,098	753	7,090	644,745

SUMMARY OF RIBES ERADICATION, 1928-1941
MONTANA OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

Forest	Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray
Kootenai	Open Reproduction	9,552	261		9,813	7,426	950,047	
	Dense Reproduction	2,952	80		3,032	1,357	151,792	
	Open Pole	15,219	779		15,998	7,599	836,364	
	Dense Pole	3,665			3,665	231	15,607	
	Open Mature	7,819			7,819	3,081	433,339	
	Dense Mature	8,608			8,608	458	48,580	
	Brush	235			235	94	7,956	
	Burn	115			115	1	32	
	Meadow-Field	103			103	1		
	All Upland	48,268	1,120		49,388	20,248	2,443,717	
	Stream (Hand)	3,050	533		3,583	8,982	1,277,034	
	All Types	51,318	1,653		52,971	29,230	3,720,751	
Cabinet	Open Reproduction	25,778	4,026	394	30,198	31,148	5,758,124	
	Dense Reproduction	1,612			1,612	438	71,747	
	Open Pole	20,963	438	38	21,439	8,439	1,524,874	
	Dense Pole	2,619	153	12	2,784	966	211,681	
	Open Mature	8,740	12		8,752	4,374	1,057,218	
	Dense Mature	557			557	88	8,566	
	Brush	3,481			3,481	2,044	583,683	
	Meadow-Field	348			348	150	12,131	
	All Upland	64,098	4,629	444	69,171	47,647	9,228,024	
	Stream (Hand)	3,717	920	72	4,709	12,440	2,970,760	
	Stream (Chemical)	465	111	12	588	1,594	106,962	35,654
	Stream (Slash)	23			23	215	11,500	
	Stream (Machine)	75			75	644	39,500	
	All Stream	3,815	920	72	4,807	14,893	3,128,722	
	All Types	67,913	5,549	516	73,978	62,540	12,356,746	
Savenac Nursery	Open Reproduction	4,806	164	25	4,995	1,259	401,125	
	Dense Reproduction	102			102	3		
	All Upland	4,908	164	25	5,097	1,262	401,125	
	Stream (Hand)	1,088	962	1,616	3,666	4,177	724,925	
	Stream (Chemical)	239	62		301	880	200,801	36,262
	Stream (Slash)	45		40	85	810	42,500	
	Stream (Machine)		15		15	36	3,000	
	All Stream	1,088	977	1,616	3,681	5,903	971,226	
	All Types	5,996	1,141	1,641	8,778	7,165	1,372,351	
All Forests	Open Reproduction	40,136	4,451	419	45,006	39,833	7,109,296	
	Dense Reproduction	4,666	80		4,746	1,798	223,539	
	Open Pole	36,182	1,217	38	37,437	16,038	2,361,238	
	Dense Pole	6,284	153	12	6,449	1,197	227,288	
	Open Mature	16,559	12		16,571	7,455	1,490,557	
	Dense Mature	9,165			9,165	546	57,146	
	Brush	3,716			3,716	2,138	591,639	
	Burn	115			115	1	32	
	Meadow-Field	451			451	151	12,131	
	All Upland	117,274	5,913	469	123,656	69,157	12,072,866	
	Stream (Hand)	7,855	2,415	1,688	11,958	25,599	4,972,719	
	Stream (Chemical)	704	173	12	889	2,474	307,763	71,916
	Stream (Slash)	68		40	108	1,025	54,000	
	Stream (Machine)	75	15		90	680	42,500	
	All Stream	7,953	2,430	1,688	12,071	29,778	5,376,982	
	All Types	125,227	8,343	2,157	135,727	98,935	17,449,848	

TABLE 7A - FIRST WORKING

Forest	Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis Man-Days	Gallons Spray
Kootenai	Open Reproduction	9,552	7,262	924,592		.76	97
	Dense Reproduction	2,952	1,356	151,725		.46	51
	Open Pole	15,219	6,992	795,874		.46	52
	Dense Pole	3,665	231	15,607		.06	4
	Open Mature	7,819	3,081	433,339		.39	55
	Dense Mature	8,608	458	48,580		.05	6
	Brush	235	94	7,956		.40	34
	Burn	115	1	32		.01	1
	Meadow-Field	103	1			.01	
	All Upland	48,288	19,476	2,377,705		.40	49
	Stream (Hand)	3,050	8,177	1,214,159		2.68	398
	All Types	51,318	27,653	3,591,864		.54	70
Cabinet	Open Reproduction	25,778	25,178	5,097,331		.98	198
	Dense Reproduction	1,612	438	71,747		.27	45
	Open Pole	20,963	8,011	1,485,860		.38	71
	Dense Pole	2,619	901	208,827		.34	80
	Open Mature	8,740	4,359	1,055,762		.50	121
	Dense Mature	557	88	8,566		.16	15
	Brush	3,481	2,044	583,683		.59	168
	Meadow-Field	348	150	12,131		.43	35
	All Upland	64,098	41,169	8,523,907		.64	133
	Stream (Hand)	3,717	10,729	2,828,039		2.89	761
	Stream (Chemical)	465	1,180	77,079	25,693	2.54	166
	Stream (Slash)	23	215	11,500		9.35	500
Savenac Nursery	Stream (Machine)	75	644	29,500		8.59	527
	All Stream	3,615	12,763	2,956,118		3.25	775
	All Types	67,913	53,937	11,480,025		.79	169
	Open Reproduction	4,806	1,043	366,010		.22	76
	Dense Reproduction	102	3			.03	
	All Upland	4,908	1,046	366,010		.21	75
	Stream (Hand)	1,088	1,710	372,268		1.57	342
	Stream (Chemical)	239	777	188,401	32,132	3.25	788
	Stream (Slash)	45	168	22,500		3.73	500
	All Stream	1,088	2,655	583,169		2.44	536
	All Types	5,996	3,701	949,179		.62	158
	Open Reproduction	40,136	33,483	6,387,933		.83	159
All Forests	Dense Reproduction	4,666	1,797	223,472		.39	48
	Open Pole	36,182	15,003	2,281,734		.41	63
	Dense Pole	5,284	1,132	224,434		.18	36
	Open Mature	16,559	7,440	1,489,101		.45	90
	Dense Mature	9,165	546	57,146		.06	6
	Brush	3,716	2,138	591,639		.58	159
	Burn	115	1	32		.01	1
	Meadow-Field	451	151	12,131		.33	27
	All Upland	117,274	61,691	11,267,622		.53	96
	Stream (Hand)	7,855	20,616	4,414,466		2.62	562
	Stream (Chemical)	704	1,957	265,480	57,825	2.78	377
	Stream (Slash)	68	383	34,000		5.63	500
All Forests	Stream (Machine)	75	644	29,500		8.59	527
	All Stream	7,933	23,600	4,753,446		2.97	598
	All Types	125,227	85,291	16,021,068		.68	128

TABLE 7B - SECOND WORKING

Kootenai	Open Reproduction	261	164	25,455		.63	98
	Dense Reproduction	80	1	67		.01	1
	Open Pole	779	607	40,490		.78	52
	All Upland	1,120	772	66,012		.69	59
	Stream (Hand)	533	805	62,895		1.51	118
	All Types	1,653	1,577	128,887		.95	78
Cabinet	Open Reproduction	4,026	5,500	606,664		1.37	151
	Open Pole	438	333	33,208		.76	76
	Dense Pole	153	61	2,794		.40	18
	Open Mature	12	15	1,456		1.25	121
	All Upland	4,629	5,909	644,122		1.28	139
	Stream (Hand)	920	1,671	137,507		1.82	149
Savenac Nursery	Stream (Chemical)	111	266	19,248	6,416	2.40	173
	All Stream	920	1,937	156,755		2.11	170
	All Types	5,549	7,846	800,877		1.41	144
	Open Reproduction	164	181	34,036		1.10	208
	Stream (Hand)	962	1,009	294,320		1.05	306
	Stream (Chemical)	62	103	12,400	4,130	1.66	200
All Forests	Stream (Machine)	15	36	3,000		2.40	200
	All Stream	977	1,149	309,720		1.18	317
	All Types	1,141	1,329	343,756		1.16	301
	Open Reproduction	4,451	5,945	666,155		1.31	150
	Dense Reproduction	80	1	67		.01	1
	Open Pole	1,217	940	73,698		.77	61
All Forests	Dense Pole	153	61	2,794		.40	18
	Open Mature	12	15	1,456		1.25	121
	All Upland	5,913	6,862	744,170		1.16	126
	Stream (Hand)	2,415	3,485	494,702		1.44	205
	Stream (Chemical)	173	369	31,648	10,546	2.13	183
	Stream (Machine)	15	36	3,000		2.40	200
All Forests	All Stream	2,430	3,890	529,350		1.50	218
	All Types	8,343	10,752	1,273,520		1.29	153

TABLE 7C - THIRD WORKING

Cabinet	Open Reproduction	394	470	54,129		1.19	137
	Open Pole	38	95	5,806		2.50	153
	Dense Pole	12	4	60		.33	5
	All Upland	444	569	59,995		1.28	135
	Stream (Hand)	72	40	5,214		.56	72
	Stream (Chemical)	12	148	10,635	3,545	12.33	886
Savenac Nursery	All Stream	72	188	15,849		2.61	220
	All Types	515	757	75,844		1.47	147
	Open Reproduction	25	35	1,079		1.40	43
	Stream (Hand)	1,616	1,458	58,337		.90	36
	Stream (Slash)	40	642	20,000		16.05	500
	All Stream	1,616	2,100	78,337		1.30	48
All Forests	All Types	1,641	2,135	79,416		1.30	48
	Open Reproduction	419	505	55,208		1.21	132
	Open Pole	38	95	5,806		2.50	153
	Dense Pole	12	4	60		.33	5
	All Upland	469	604	61,074		1.29	130
	Stream (Hand)	1,699	1,499	63,551		.82	38
All Forests	Stream (Chemical)	12	148	10,635	3,545	12.33	886
	Stream (Slash)	40	642	20,000		16.05	500
	All Stream	1,689	2,298	94,186		1.36	56
	All Types	2,157	2,892	155,260		1.34	72

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1928-1941
MONTANA OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis		
						Man- Days	Ribes	Gallons Per Sprayed Area
First	EQ-Reg.	1,383	2,315	462,300	30,665	1.67	334	148
	FS-Reg.	12,524	11,392	1,653,529	2,452	.91	132	54
	EQ-NIRA	21,773	8,027	2,158,067		.37	99	
	FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211	40
	EQ-ERA	42,313	20,386	3,292,671	1,330	.48	78	44
	FS-ERA	11,247	16,299	2,473,391	10,181	1.45	220	90
	F-CCC	13,772	10,083	1,296,868	2,780	.73	94	59
Second	Total	125,227	85,291	16,021,068	57,825	.68	128	82
	EQ-Reg.	619	980	299,410	4,130	1.58	484	67
	FS-Reg.	3,604	3,537	341,025	5,376	.98	95	59
	EQ-ERA	1,342	1,597	265,637		1.19	198	
	FS-ERA	2,100	2,464	204,021	1,040	1.17	97	52
	F-CCC	678	2,174	163,427		3.21	241	
	Total	8,343	10,752	1,273,520	10,546	1.29	153	61
Third	FS-Reg.	1,334	1,864	78,437		1.40	59	
	EQ-ERA	648	777	59,040		1.20	91	
	FS-ERA	150	68	6,069		.45	40	
	F-CCC	25	183	11,714	3,545	7.32	469	295
	Total	2,157	2,892	155,260	3,545	1.34	72	295
All Workings	EQ-Reg.	2,002	3,295	761,710	34,795	1.65	380	129
	FS-Reg.	17,462	16,793	2,072,991	7,828	.96	119	58
	EQ-NIRA	21,773	8,027	2,158,067		.37	99	
	FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211	40
	EQ-ERA	44,303	22,760	3,617,348	1,330	.51	82	44
	FS-ERA	13,497	18,831	2,683,481	11,221	1.40	199	84
	F-CCC	14,475	12,440	1,472,009	6,325	.86	102	107
	Total	135,727	98,935	17,449,848	71,916	.73	129	81

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1928-1941
MONTANA OPERATION

Forest	Working	Number of Acres Worked by Ownership Classes			Total
		Forest Service	State - Montana	Private	
Kootenai	First	46,781		4,537	51,318
	Second	1,165		488	1,653
	Total	47,946		5,025	52,971
Cabinet	First	56,615	696	16,598	73,909
	Second	5,211		1,479	6,690
	Third	897		1,260	2,157
	Total	62,723	696	19,337	82,756
All Forests	First	103,396	696	21,135	125,227
	Second	6,376		1,967	8,343
	Third	897		1,260	2,157
	Total	110,669	696	24,362	135,727

TABLE 10

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1928-1941
MONTANA OPERATION

Forest	Ownership Class	Number of Acres			Acres Mature Stands on Which Working Is Deferred	Total Acres White Pine
		Worked	Unworked	Total		
Kootenai	Forest Service	46,781	28,720	75,501	11,394	86,895
	State - Montana		234	234		234
	Private	4,537	5,749	10,286	2,490	12,776
	Total	51,318	34,703	86,021	13,884	99,905
Cabinet	Forest Service	56,615	17,703	74,318	2,312	76,630
	State - Montana	696		696		696
	Private	16,598	6,911	23,509		23,509
	Total	73,909	24,614	98,523	2,312	100,835
All Forests	Forest Service	103,396	46,423	149,819	13,706	163,525
	State - Montana	696	234	930		930
	Private	21,135	12,660	33,795	2,490	36,285
	Total	125,227	59,317	184,544	16,196	200,740

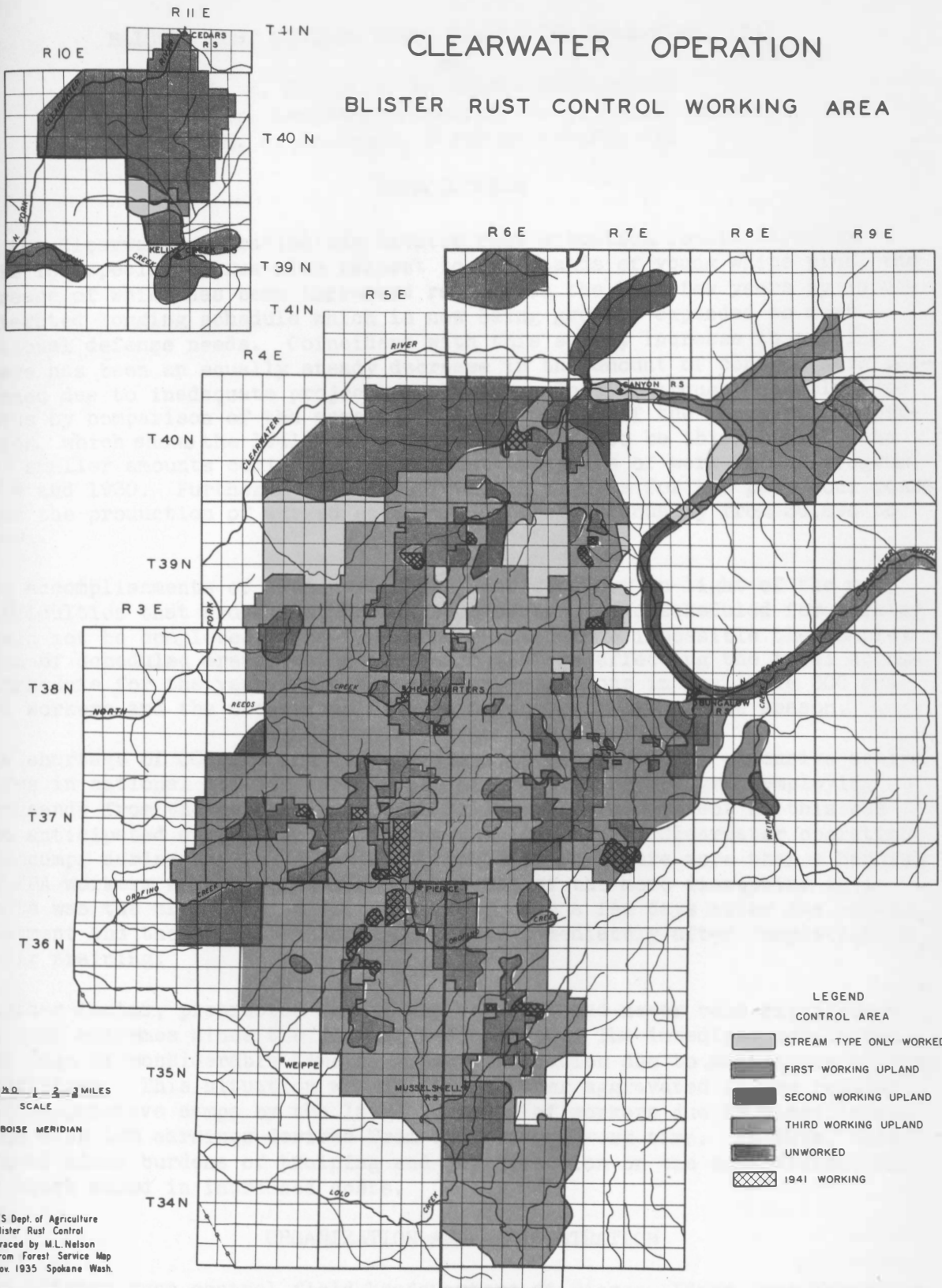
TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1928-1941
MONTANA OPERATION

Working	Eradication Type	Acres	Ribes by Species							Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes coloradense	Ribes triste	
First	Open Reproduction	40,136	2,948,827	3,262,748	4,714	55,569	113,754	1,176	1,145	6,387,933
	Dense Reproduction	4,666	146,302	73,843			1,048	2,279		223,472
	Open Pole	36,182	1,247,974	864,605	200	93,026	75,929			2,281,734
	Dense Pole	6,284	130,061	77,785		8,179	8,409			224,434
	Open Mature	16,559	1,289,375	172,589	259	11,080	8,729	7,069		1,489,101
	Dense Mature	9,165	52,151	4,807				188		57,146
	Brush	3,716	286,409	294,808		5,260	5,162			591,639
	Burn	115	32							32
	Meadow-Field	451	5,010			7,121				12,131
	All Upland	117,274	6,106,141	4,751,185	5,173	180,235	213,031	10,712	1,145	11,267,622
	Stream	7,953	3,026,316	118,098	266,006	1,284,254	5,744	31,905	21,123	4,753,446
	All Types	125,227	9,132,457	4,869,283	271,179	1,464,489	218,775	42,617	22,268	16,021,068
Second	Open Reproduction	4,451	367,461	275,909	4,860	4,668	10,666		2,591	666,155
	Dense Reproduction	80	63	4						67
	Open Pole	1,217	44,067	22,576		6,134	921			73,698
	Dense Pole	153	801	1,708		285				2,794
	Open Mature	12	1,456							1,456
	All Upland	5,913	413,848	300,197	4,860	11,087	11,587		2,591	744,170
	Stream	2,430	142,877	3,123	41,728	324,083	10,975		6,564	529,350
Third	All Types	8,343	556,725	303,320	46,588	335,170	22,562		9,155	1,273,520
	Open Reproduction	419	30,772	24,236			200			55,208
	Open Pole	38	800	5,000			6			5,806
	Dense Pole	12	60							60
	All Upland	469	31,572	29,296			206			61,074
	Stream	1,688	7,867	20	17,574	61,635			7,090	94,186
All Workings	All Types	2,157	39,439	29,316	17,574	61,635	206		7,090	155,260
	Open Reproduction	45,006	3,347,060	3,562,893	9,574	60,237	124,620	1,176	3,736	7,109,296
	Dense Reproduction	4,746	146,365	73,847			1,048	2,279		223,539
	Open Pole	37,437	1,292,841	892,181	200	99,160	76,856			2,361,238
	Dense Pole	6,449	130,862	79,553		8,464	8,409			227,288
	Open Mature	16,571	1,290,831	172,589	259	11,080	8,729	7,069		1,490,557
	Dense Mature	9,165	52,151	4,807				188		57,146
	Brush	3,716	286,409	294,808		5,260	5,162			591,639
	Burn	115	32							32
	Meadow-Field	451	5,010			7,121				12,131
	All Upland	123,656	6,551,561	5,080,678	10,033	191,322	224,824	10,712	3,736	12,072,866
	Stream	12,071	3,177,060	121,241	325,308	1,669,972	16,719	31,905	34,777	5,376,992
	All Types	135,727	9,728,621	5,201,919	335,341	1,861,294	241,543	42,617	38,513	17,449,848

CLEARWATER OPERATION

BLISTER RUST CONTROL WORKING AREA



BLISTER RUST CONTROL WORK, CLEARWATER OPERATION, 1941

By

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INTRODUCTION

On the Clearwater operation the blister rust situation remains serious. This is especially true with respect to the stands of young white pine, the acreage of which has been increased rapidly in the last few years by an accelerated logging schedule which is now being greatly expanded to meet national defense needs. Coincident with this steady increase in cutting there has been an equally steady decrease in the amount of control work performed due to inadequate project facilities. This is brought sharply into focus by comparison of the acreages worked in each of the 13 years of operation, which shows the 1941 results of 8,601 acres to be third lowest, the two smaller amounts coming from the first two years of work in the program, 1929 and 1930. Further evidence is found in figures for the past four years when the production of worked acres has decreased annually from 38,696 to 8,601.

The accomplishments of 1941 were wholly satisfactory in light of the many difficulties that arose even though some of the areas scheduled for working could not be completed. The two factors which made impossible the completion of scheduled areas, which were also factors affecting the total accomplishments for the year, were the drastic reductions in available CCC and WPA workers and the occurrence of rain throughout most of the season.

The shortage of CCC and WPA workers was a direct result of extensive activities in national defense work including the military program employing thousands from the selective service rolls. The full extent of this was not anticipated during the spring, so the loss of all Clearwater operation CCC camps during the season and the inability to secure more than a handful of WPA workers were serious handicaps. One of the more disrupting incidents was the closing of a CCC spike camp only a few days after its establishment and the loss of several CCC crews immediately after completion of their training.

Another factor, protracted rains, was one that had never been experienced in such extremes since the program was started. The immediate result was the loss of considerable time on ribes eradication due to unsuitable working conditions. This situation was in time further aggravated in the regular and cooperative camps by the large turnover of workers due to dissatisfaction with low earnings derived from the reduced work time. In turn, this placed added burdens of training and job direction on the supervision, all of which ended in increased costs.

ORGANIZATION AND ADMINISTRATION

The blister rust control field headquarters at Pierce, Idaho, was opened on April 21. This served as the operation headquarters for all blister rust control work and as the warehouse and supply base for all Bureau camps.

All warehousing and supply for Forest Service blister rust work were handled at the Pierce Ranger Station warehouse which is the Forest Service central supply depot.

The first camp was established May 6, and all camps were in the field by June 16. Considerable difficulty was encountered in moving equipment to the field. The roads were in very poor condition due to rain, but since men had been ordered, the camps had to be established. The blister rust control personnel of the Bureau and Forest Service worked in close cooperation in establishing camps and all other phases of the work.

For the first time since 1932, the Bureau operated cooperative camps on the Clearwater operation. These consisted of two 33-man units financed by a combination of federal, state and private funds. In addition, the Bureau had one 20-man WPA camp financed by Emergency Relief Appropriation funds.

Camps operated by the Forest Service included three 33-man camps and one 66-man unit. All of these were maintained with regular funds appropriated specifically for blister rust control work.

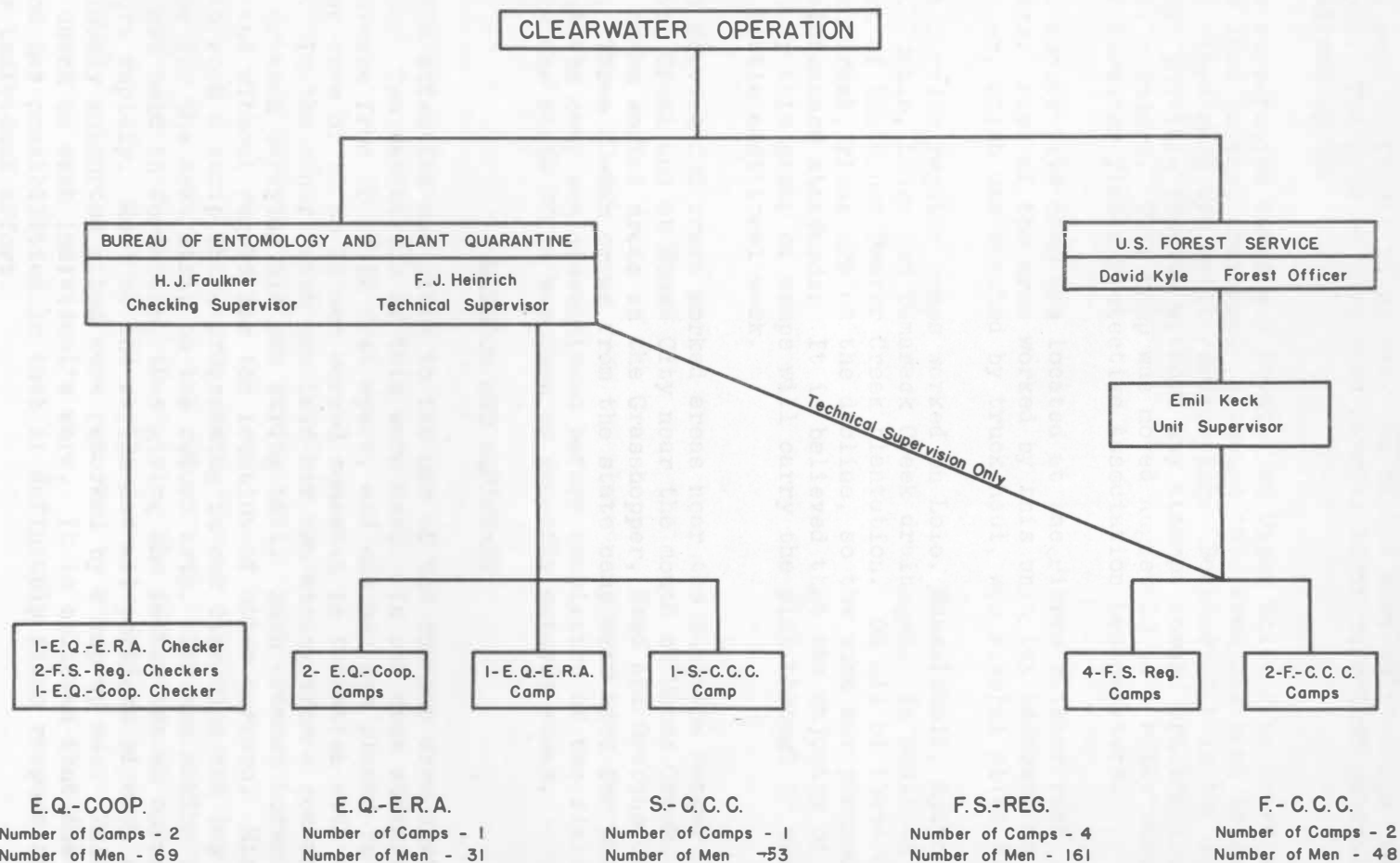
The CCC program consisted of crews from one state and two Forest Service CCC camps. The state camp, located at Brown Creek, furnished three 20-man crews until the camp was discontinued. A 50-man spike camp was established at Moose City from the North Fork Forest Service camp. The spike camp was closed a few days after it was manned due to the discontinuation of the main camp. A spike camp from the Bungalow Camp was established at Upper Beaver Creek.

The personnel, other than supervisory, were hired differently for the three classes of camps. Workers in WPA camps were certified relief men assigned by the Work Projects Administration. Men for the cooperative camps were hired through the office of the Idaho State Forester. Workers for the Forest Service camps were hired mainly through the United States Employment Service although a quota of 30 per cent forestry school students was planned prior to the field season. This quota was not filled, the maximum employed from this source reaching only about five per cent.

Most of the WPA workers were quite old for woods work, but care in selection of work area for them resulted in very satisfactory accomplishments. The cooperative camp men were nearly 100 per cent inexperienced, and many were well below the general minimum age requirement of 18 years. After an intensive training period, however, they did satisfactory work. Personnel for the Forest Service camps were not up to last years standard. This was due primarily to defense activities having absorbed a large percentage of the experienced and otherwise more desirable employees.

All ribes eradication work during the past season was performed on cutover and white pine reproduction areas. The Clearwater work plans call for the protection of these younger stands before moving to the older and less threatened age classes. Camps under the jurisdiction of the Bureau performed work mostly on cutover areas while the Forest Service camps worked chiefly in stands of reproduction.

ORGANIZATION CHART



Total Number of Men on Blister Rust Work - 362

The ERA camp was located on Poorman Creek and worked entirely on cutover area which contained a heavy population of Ribes viscosissimum. Although working conditions were difficult in places, the bushes were quite large and visibility was good. The pine on this area carries light infection generally, with heavy localized spots.

One of the cooperative camps was located on Upper White Pine Creek and worked on cutover land in that drainage. Although this area has been logged for ten years, the ribes seed are still germinating. Because of this the working was for the best possible results without any attempt toward eradication to the maintenance standard. This camp was moved August 20 to a spike camp site near the Clearwater Timber Protective Association headquarters.

The second cooperative camp was located at the Pierce blister rust control headquarters. Part of the area worked by this unit lay adjacent to camp, and the remainder, which was reached by truck haul, was several miles distant.

The Forest Service regular camps worked on Lolo, Musselshell, Sylvan, Joy, Dead Mule, Tumble, Lodge and Tamarack Creek drainages. In addition they worked part of the Upper Beaver Creek plantation. On all of these areas except Sylvan Creek, ribes are on the decline, so the work was planned to achieve maintenance standards. It is believed that the majority of the acreage worked by this group of camps will carry the pine through to maturity with very little additional work.

The Forest Service CCC crews worked areas near the Bungalow Ranger Station, Upper Beaver Creek and at Moose City near the mouth of Moose Creek. The state CCC crews worked areas in the Grasshopper, Reed and Orofino Creek drainages. Three 20-man crews from the state camp were used for part of the season, but the camp was discontinued before completion of the field work. All work by the state CCC's was done on recently cutover areas.

METHODS AND EQUIPMENT

Considerable attention was given to the use of the one-man crew during the past season. Two variations of this were used. In one case strings were laid in advance from 10 to 12 feet apart, and one man was placed in each strip. The crew of 10 to 12 men worked somewhat in formation with a foreman in charge. In the other, each man laid his own string from a common base with each crewman carrying his own string ball. Each crewman worked independently and without regard for the location of other workers. His procedure was to work a strip while progressing in one direction and lay the string line for the next strip on the return trip. The men making up the crew were not held in formation, thus giving the faster men an opportunity to move more rapidly. Most of the strips and all portions of each strip that previously supported ribes were reworked by a mop-up man. This gave an excellent check on each individual's work. It is believed that the one-man crew method has possibilities in that it definitely fixes responsibility and encourages individual effort.

PREERADICATION SURVEY

During the fall months after the camps were closed considerable time was spent by the permanent personnel in inspecting specific areas within the control boundary. This did not include a systematic survey but rather a general sampling based on previous recorded data.

The Sourdough sales area located in T. 40 N., R. 7 E., was inspected carefully this year in order to determine if protection should be attempted at this time. The area was logged in 1939-1940 with only white pine being removed. There remains a medium to heavy overwood consisting of white pine seed trees, cedar poles and allied species. There are some white pine seedlings becoming established in direct association with ribes. The ribes germination will be prolonged due to the variation in ground disturbance and overwood densities.

To protect this area would call for yearly workings for several years. Furthermore when the cedar poles are removed the disturbance created would cause another heavy germination of ribes resulting in costly control measures. Under the present conditions it does not seem advisable to undertake control measures until the cedar poles are removed.

CHECKING AND PINE DISEASE SURVEY

The checking work included the regular activities, namely, advance, regular and post check. In addition, pine disease survey work, which in previous years has been conducted as a separate project, was incorporated as a function of the checking organization. This necessitated few changes other than additional training of checking personnel.

Standardized methods and procedures were employed in checking most areas. Those approaching a maintenance standard were more intensively checked than those recognized as requiring future workings. No systematic checks were run on recently cutover lands where the ribes population was still increasing. Pine disease survey field work was carried on in conjunction with post checking work. Advance surveys were run before eradication work on all areas where recent ribes information was not available.

Regular check was run following eradication on 5,588 acres of upland area. The average cost per acre for this check was \$0.131 per acre.

Combining disease survey and post checking appears to be both timely and economical for it results in the procurement of disease information and ribes data at the same time, and for the consideration of these together in control planning. The requirements for disease survey on the operation this year were small due to the large amount of area covered by pine disease survey crews during 1940.

Following are reports by drainages for areas surveyed during 1941:

Upper North Fork of Clearwater River, T. 41 N., R. 11 E.

No ribes eradication work has been done in this area. The topography is quite steep and the site only fair for white pine growth. A fairly well-stocked stand of pine occurs on the first one-quarter to one-half mile of the slopes over most of the area.

Ribes petiolare generally distributed along the streams varies from light to heavy in abundance. Upland ribes are predominantly R. lacustre averaging about 100 per acre.

Acres in area	700
Miles of strip	2.7
Number trees examined	1,356
Number trees infected	773
Per cent infection	57
Per cent reinfection	28
Number cankers found	4,915

Damage in this area is not as heavy as the per cent of infection and reinfection would indicate. The rust became established prior to 1933, but the build-up was slow up to 1937 with 93 per cent of the infection originating in 1937, 1938 and 1939. The stand was approximately 15 years old in 1937 and passing the age where extremely heavy damage would result from two or three waves of infection. Approximately 28 per cent of the infected trees had probable damaging cankers and 16 per cent of the trees examined were classified as being damaged. However, 1940 and 1941 infection will probably raise the per cent of damage considerably.

Big Horn Area, T. 38 N., R. 8 E.

This area supports a well-stocked stand of 20 year old white pine reproduction. Blister rust became established in 1929 and increased until 25 per cent of the trees were infected by 1934 when first eradication work was done. The 1934 eradication did not materially slow the progress of the rust, for by 1939 the per cent of infected trees had reached 72.5, with approximately 50 per cent having probable damaging cankers.

Working conditions are very difficult due to steepness of slopes and wind-fall and heavy brush intermingled with numerous R. viscosissimum plants. In view of these factors and the large amount of pine infection, it is doubtful if future workings would be justified.

Acres in area	500
Miles of strip	.25
Number trees examined	262
Number trees infected	190
Per cent infection	72.5
Per cent reinfection	50
Number cankers found	1,570

Upper Beaver Creek Area, T. 39 N., R. 5 E.

This area was logged during 1929 and 1930. Large numbers of R. viscosissimum and R. lacustre came in following the logging and brush disposal operations. Pine reproduction is only fair and somewhat spotted due to a heavy stand of old fir and cedar left standing on parts of the area. Blister rust became established in 1932 but spread very slowly up to 1937 when a heavy intensification occurred. The 1938 rework on two parts of this area succeeded in slowing the progress of the rust considerably during 1938 and 1939. On the third part the rust continued to increase at a fairly rapid rate during 1938 and 1939.

Class of Data	Area Number and Year of Eradication		
	(1) 1934	(2) 1934, 1938	(3) 1935, 1938
Acres in area	640	720	560
Miles of strip	.4	.9	1.1
No. trees examined	127	154	277
No. trees infected	61	42	85
Per cent trees infected	48	27	31
Per cent trees reinfected	17	1	5
No. cankers found	395	105	193

Ribes average approximately 40 per acre over most of the area, and a future eradication will be necessary before protection is established.

Upper Beaver Creek Plantation, T. 39 N., R. 5 E.

White pine was cut from this area in 1929, leaving a residual stand of old decadent fir and cedar. This was felled in 1936 after which the area was broadcast burned. In 1937 and 1938 white pine and spruce were planted on the treated area by the Forest Service which acquired ownership of the land following logging. The broadcast burn was not of sufficient intensity to preclude large numbers of R. viscosissimum and some R. lacustre germinating during the first year of planting and to a lesser extent in the succeeding two to three years. Therefore, partial eradications were performed in 1938 and 1939, but due to the large number of seedlings and small bushes, protection could not be established. A thorough eradication was done in 1941, the bushes being reduced to less than seven per acre and live stem to five feet per acre.

Due to the very young age of the pine when infection took place, practically 100 per cent of the infected trees will be killed.

Acres in area	800
Miles of strip	1.5
Number trees examined	674
Number trees infected	44
Per cent infection	6.5
Per cent reinfection	None
Number cankers found	79

A small amount of maintenance work should be sufficient to protect this area in the future.

Yoosa Creek Area, T. 35 N., R. 7 E.

This area supports a fairly well-stocked stand of 40 year old white pine pole. There is a scattered overstory of mature white fir over parts of the area which has suppressed the white pine in the immediate vicinity. It is this suppressed pine which carries most of the infection on the area. Ribes are predominantly R. lacustre occurring along streams and other moist places with only scattered suppressed R. viscosissimum in the upland. The combined average of all species is about 20 per acre.

Acres in area	400
Miles of strip	1.1
Number trees examined	172
Number trees infected	37
Per cent infection	21.5
Per cent reinfection	3
Number cankers found	67

Due to the advanced age of the stand and species of ribes involved, it is doubtful if future work will be necessary in this area. If future surveys show that the rust is increasing to the point where damage is likely to occur, eradication in the stream type and stream zone would be sufficient to fully protect the area.

CANKER ELIMINATION

The pruning of infected limbs from white pine for the purpose of decreasing aecial production and saving trees that would otherwise soon be lost, was practiced this year for the first time on the Clearwater operation. The work was performed by a few WPA workers before the ribes eradication season started. A 13 year old stand on the Powder House area, T. 37 N., R. 5 E., sec. 22, was selected for this work. This stand contains localized spots of heavy infection, most of which occurred on the lower branches. The sanitation procedure was to remove the lower third of the crown and any individual cankers above that point, as well as all trees with trunk cankers. All branches were cut close to the trunk with hand shears. Results of this show a total of 11,480 trees treated with 25 man-days of labor. In addition 175 trees, which were already severely damaged by trunk cankers, were removed.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables by the cooperative agency and the type of appropriation:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941
CLEARWATER OPERATION

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	\$62,934.95
	Regular	8,775.63
Bureau of Entomology and Plant Quarantine	Regular-Coop.	2,128.01
	Idaho-ERA	14,407.62
	Total	25,311.26
Idaho	State	2,583.05
CTPA	Private	6,366.32
	Total	8,949.37
All Agencies	Total	\$97,195.58

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941
CLEARWATER OPERATION

Item	Forest Service	Bureau of Entomology and Plant Quarantine			Contributed Funds	Total
	Regular	Regular	ERA	Total	Idaho and CTPA	
Salaries, perm. men	\$ 1,350.00	\$ 6,000.00		\$ 6,000.00		\$ 7,350.00
Salaries, temp. men	12,994.48		\$ 871.24	871.24		13,865.72
Wages, temp. laborers	33,560.84	1,975.06	9,100.64	11,075.70	\$8,949.37	53,585.91
Subsistence supplies	12,393.02	1,978.28	2,445.86	4,424.14		16,817.16
Equipment	1,569.66	23.42	73.85	97.27		1,666.93
Travel and transp.	970.09	379.67	942.79	1,322.46		2,292.55
Other supplies	96.86	547.21	973.24	1,520.45		1,617.31
Total	\$62,934.95	\$10,903.64	\$14,407.62	\$25,311.26	\$8,949.37	\$97,195.58

TABLE 2A

DISTRIBUTION OF BLISTER RUST CONTROL EXPENDITURES BY PROGRAMS
CLEARWATER OPERATION

Program	Number of Effective Man-Days	Expenditures According to Fund		Effective Man-Day Cost
Planning, Coordination and Technical Direction		EQ-Reg.	\$ 4,500.00	
FS-Reg.	7,109	FS-Reg.	61,272.26	\$8.62
Cooperative	2,734	Idaho	2,583.05	5.51
		CTPA	6,366.32	
		EQ-Reg.	4,275.63	
		EQ-Reg.-Coop.	2,128.01	
		Total	15,353.01	
EQ-ERA	657	EQ-ERA	6,077.25	9.25
CCC	2,529	FS-Reg.	1,662.69	CCC Funds Not Included
Pine Disease Survey	85	EQ-ERA	799.00	9.40
Canker Elimination	25	EQ-ERA	237.50	9.50
Winter Project	802	EQ-ERA	7,293.87	9.10
Total Cost of 1941 Program			\$97,195.58	

	Forest Service	Bureau
Number of meals served	57,447	22,009
Average cost per meal	\$0.216	\$0.211
Pounds of twine used	2,205	2,501
Pounds of chemical used	5,489	405

SUMMARY OF RIBES ERADICATION, 1941
CLEARWATER OPERATION

TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
								Bushes	Live Stem
Open Reproduction	92	3,976	607	4,675	8,181	651,829		11.5	17.0
Cutover		2,540	1,223	3,763	4,298	376,905		19.4	30.0
All Upland	92	6,516	1,830	8,438	12,479	1,028,734		13.5	20.3
Stream (Hand)		208		208	265	17,174			
Stream (Chemical)		199		199	335	15,084	5,028		
All Stream		208		208	600	32,258			
All Types	92	6,724	1,830	8,646	13,079	1,060,992		13.5	20.3

TABLE 3A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis		Ribes Remaining Per Acre	
					Man- Days	Ribes	Bushes	Live Stem
Open Reproduction	92	357	30,610		3.88	333		

TABLE 3B - SECOND WORKING

Open Reproduction	3,976	6,987	580,345		1.76	146		6.3	7.6
Cutover	2,540	2,937	264,419		1.16	104		21.0	37.1
All Upland	6,516	9,924	844,764		1.52	130		9.5	13.9
Stream (Hand)	208	265	17,174		1.27	83			
Stream (Chemical)	199	335	15,084	5,028	1.68	76	25		
All Stream	208	600	32,258		2.88	155			
All Types	6,724	10,524	877,022		1.57	130		9.5	13.9

TABLE 3C - THIRD WORKING

Open Reproduction	607	837	40,874		1.38	67		20.1	32.8
Cutover	1,223	1,361	112,486		1.11	92		17.9	23.0
All Upland	1,830	2,198	153,360		1.20	84		19.4	29.7

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941
CLEARWATER OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man- Days	Ribes	Gallons Per Sprayed Area	Bushes	Live Stem
First	F-CCC	92	357	30,610		3.88	333			
Second	EQ-ERA	398	606	58,906		1.52	148		15.1	37.0
	FS-Reg.	3,112	6,374	569,954	1,464	2.05	183	11	6.3	7.6
	EQ-Coop.	2,048	1,492	89,899	405	.73	44	17		
	F-CCC	148	484	24,032	3,159	3.27	162	43		
	S-CCC	1,018	1,568	134,231		1.54	132		23.5	37.1
Third	Total	6,724	10,524	877,022	5,028	1.57	130	25	9.5	13.9
	EQ-ERA	40	51	3,300		1.28	83			
	FS-Reg.	566	735	37,585		1.30	66		5.3	3.7
	EQ-Coop.	1,173	1,292	107,776		1.10	92		23.7	37.8
	F-CCC	41	102	3,289		2.49	80			
All Workings	S-CCC	10	18	1,410		1.80	141			
	Total	1,830	2,198	153,360		1.20	84		19.4	29.7
	EQ-ERA	438	657	62,206		1.50	142		15.1	37.0
	FS-Reg.	3,678	7,109	607,539	1,464	1.93	165	11	6.2	7.0
	EQ-Coop.	3,221	2,784	197,675	405	.86	61	17	23.7	37.8
All Workings	F-CCC	281	943	57,931	3,159	3.36	206	43		
	S-CCC	1,028	1,586	135,641		1.54	132		23.5	37.1
	Total	8,646	13,079	1,060,992	5,028	1.51	123	25	13.5	20.3

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941
CLEARWATER OPERATION

State	Working	Number of Acres Worked								Total
		By Forest Service		By Bureau of Entomology and Plant Quarantine			Total			
		Forest Service	Private	Forest Service	State	Private	Forest Service	State	Private	
Idaho	First	92					92			92
	Second	3,245	15		190	3,274	3,245	190	3,289	6,724
	Third	527	80	360		863	887		943	1,830
	Total	3,864	95	360	190	4,137	4,224	190	4,232	8,646

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
CLEARWATER OPERATION

Working	Eradication Type	Acres	Ribes by Species				Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes irriguum	
First	Open Reproduction	92	13,891	16,719			30,610
Second	Open Reproduction	3,976	189,893	389,546	906		580,345
	Cutover	2,540	43,818	209,653	10,726	222	264,419
	All Upland	6,516	233,711	599,199	11,632	222	844,764
	Stream	208	17,174		15,084		32,258
	All Types	6,724	250,885	599,199	26,716	222	877,022
Third	Open Reproduction	607	15,487	25,317	56	14	40,874
	Cutover	1,223	32,755	79,347	384		112,486
	All Upland	1,830	48,242	104,664	440	14	153,360
All Workings	All Types	1,830	48,242	104,664	440	14	153,360
	Open Reproduction	4,675	219,271	431,582	962	14	651,829
	Cutover	3,763	76,573	289,000	11,110	222	376,905
	All Upland	8,438	295,844	720,582	12,072	236	1,028,734
	Stream	208	17,174		15,084		32,258
All Workings	All Types	8,646	313,018	720,582	27,156	236	1,060,992

SUMMARY OF RIBES ERADICATION, 1929-1941
CLEARWATER OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray
Open Reproduction	58,463	20,460	2,324	81,247	131,747	35,351,727	
Dense Reproduction	11,088	493		11,581	5,286	1,164,891	
Open Pole	25,677	11,284		36,961	21,382	4,527,630	
Dense Pole	3,534	1,569		5,103	1,553	292,973	
Open Mature	213,980	15,743		229,723	107,122	24,099,942	
Dense Mature	5,309	324		5,633	559	134,244	
Cutover	27,726	32,345	6,002	66,073	66,285	21,185,916	
Brush	2,795	79		2,874	2,578	732,633	
Burn	1,045	432		1,477	1,777	1,285,330	
Subalpine	122			122	118	53,948	
Meadow-Field	1,890			1,890			
All Upland	351,629	82,729	8,326	442,684	338,407	88,829,234	
Stream (Hand)	41,606	21,935	2,174	65,715	62,904	14,019,434	
Stream (Chemical)	14,430	5,709	498	20,637	38,397	2,670,705	890,035
Stream (Slash)	65	13		78	1,258	188,983	
Stream (Zone)		1,666		1,666	1,129	280,094	
All Stream	41,671	23,614	2,174	67,459	103,698	17,159,216	
All Types	393,300	106,343	10,500	510,143	442,095	105,988,450	

TABLE 7A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis		
					Man- Days	Ribes	Gallons Spray
Open Reproduction	58,463	99,254	31,966,183		1.70	547	
Dense Reproduction	11,088	5,214	1,161,593		.47	105	
Open Pole	25,677	15,201	3,600,567		.59	140	
Dense Pole	3,534	937	185,062		.27	52	
Open Mature	213,980	99,387	23,291,483		.46	109	
Dense Mature	5,309	493	130,871		.09	25	
Cutover	27,726	25,888	10,610,089		.93	383	
Brush	2,795	2,536	729,247		.91	261	
Burn	1,045	1,246	917,609		1.19	878	
Subalpine	122	118	53,948		.97	442	
Meadow-Field	1,890						
All Upland	351,629	250,274	72,646,652		.71	207	
Stream (Hand)	41,606	43,841	11,105,816		1.05	287	
Stream (Chemical)	14,430	30,055	2,300,855	766,685	2.08	159	53
Stream (Slash)	65	1,233	188,983		18.97	2,907	
All Stream	41,671	75,129	13,595,654		1.80	326	
All Types	393,300	325,403	86,242,306		.83	219	

TABLE 7B - SECOND WORKING

Open Reproduction	20,460	29,495	3,138,521		1.44	153	
Dense Reproduction	493	72	3,298		.15	7	
Open Pole	11,284	6,181	927,063		.55	82	
Dense Pole	1,569	616	107,911		.39	69	
Open Mature	15,743	7,735	808,459		.49	51	
Dense Mature	324	66	3,373		.20	10	
Cutover	32,345	33,547	9,772,134		1.04	302	
Brush	79	42	3,386		.53	43	
Burn	432	531	367,721		1.23	851	
All Upland	82,729	78,285	15,131,866		.95	183	
Stream (Hand)	21,935	17,459	2,678,255		.80	122	
Stream (Chemical)	5,709	7,988	355,177	118,459	1.40	62	21
Stream (Slash)	13	25			1.92		
Stream (Zone)	1,666	1,129	280,094		.68	168	
All Stream	23,614	26,601	3,313,526		1.13	140	
All Types	106,343	104,886	18,445,392		.99	173	

TABLE 7C - THIRD WORKING

Open Reproduction	2,324	2,998	247,023		1.29	106	
Cutover	6,002	6,850	803,693		1.14	134	
All Upland	8,326	9,848	1,050,716		1.18	126	
Stream (Hand)	2,174	1,604	235,363		.74	108	
Stream (Chemical)	498	354	14,673	4,891	.71	29	10
All Stream	2,174	1,958	250,036		.90	115	
All Types	10,500	11,806	1,300,752		1.12	124	

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1941
CLEARWATER OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis		
						Man-Days	Ribes	Gallons Per Sprayed Area
First	FS-Reg.	11,303	17,065	6,328,090	18,060	1.51	560	72
	EQ-NIRA	19,009	12,345	5,679,694	13,361	.65	299	69
	FS-NIRA	41,460	33,021	12,605,276	11,694	.80	304	79
	EQ-ERA	62,640	60,861	14,881,129	75,622	.97	238	77
	FS-ERA	2,503	3,769	1,427,903		1.51	570	
	EQ-Coop.	91,453	59,665	18,267,124	283,158	.65	200	36
	F-CCC	66,586	62,203	12,966,444	153,039	.93	195	59
	S&P-CCC	98,346	76,474	14,086,646	211,751	.78	143	87
	Total	393,300	325,403	86,242,306	766,685	.83	219	53
Second	FS-Reg.	20,671	21,865	3,005,555	8,400	1.06	145	21
	EQ-NIRA	1,076	660	159,890	3,355	.61	149	45
	FS-NIRA	2,498	2,342	175,212	8,007	.94	70	21
	EQ-ERA	45,919	45,007	9,000,921	42,399	.98	196	28
	FS-ERA	8,249	5,184	514,730	2,044	.63	62	27
	EQ-Coop.	6,891	4,390	643,009	10,958	.64	93	3
	F-CCC	10,563	12,639	1,500,100	21,162	1.20	142	44
	S&P-CCC	10,476	12,799	3,445,975	22,134	1.22	329	19
	Total	106,343	104,556	18,445,392	118,459	.99	173	15
Third	FS-Reg.	1,292	1,291	102,138		1.00	79	
	FS-NIRA	914	747	127,700	1,922	.82	140	3
	EQ-ERA	5,326	6,404	676,459	2,110	1.20	127	19
	FS-ERA	284	319	44,201	348	1.12	156	3
	EQ-Coop.	1,173	1,292	107,776		1.10	92	
	F-CCC	724	880	77,248	511	1.22	107	2
	S&P-CCC	787	873	165,230		1.11	210	
All Workings	Total	10,500	11,806	1,300,752	4,891	1.12	124	9
	FS-Reg.	33,266	40,221	9,435,783	26,460	1.21	284	41
	EQ-NIRA	20,085	13,005	5,839,584	16,716	.65	291	62
	FS-NIRA	44,872	36,110	12,908,188	21,623	.80	288	36
	EQ-ERA	113,885	112,272	24,558,509	120,131	.99	216	46
	FS-ERA	11,036	9,272	1,986,834	2,392	.84	180	13
	EQ-Coop.	99,517	65,347	19,017,909	294,116	.66	191	26
	F-CCC	77,873	75,722	14,543,792	174,712	.97	187	53
	S&P-CCC	109,609	90,146	17,697,851	233,885	.82	161	66
	Total	510,143	442,095	105,988,450	890,035	.87	208	39

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1941
CLEARWATER OPERATION

Working	Number of Acres Worked by Ownership Classes				Total	
	Federal			State - Idaho		
	Forest Service	Public Domain	Total			
First	148,186	3,680	151,866	78,834	162,600	393,300
Second	47,445	628	48,073	14,808	43,462	106,343
Third	3,660	12	3,672	883	5,945	10,500
All Workings	199,291	4,320	203,611	94,525	212,007	510,143

TABLE 10

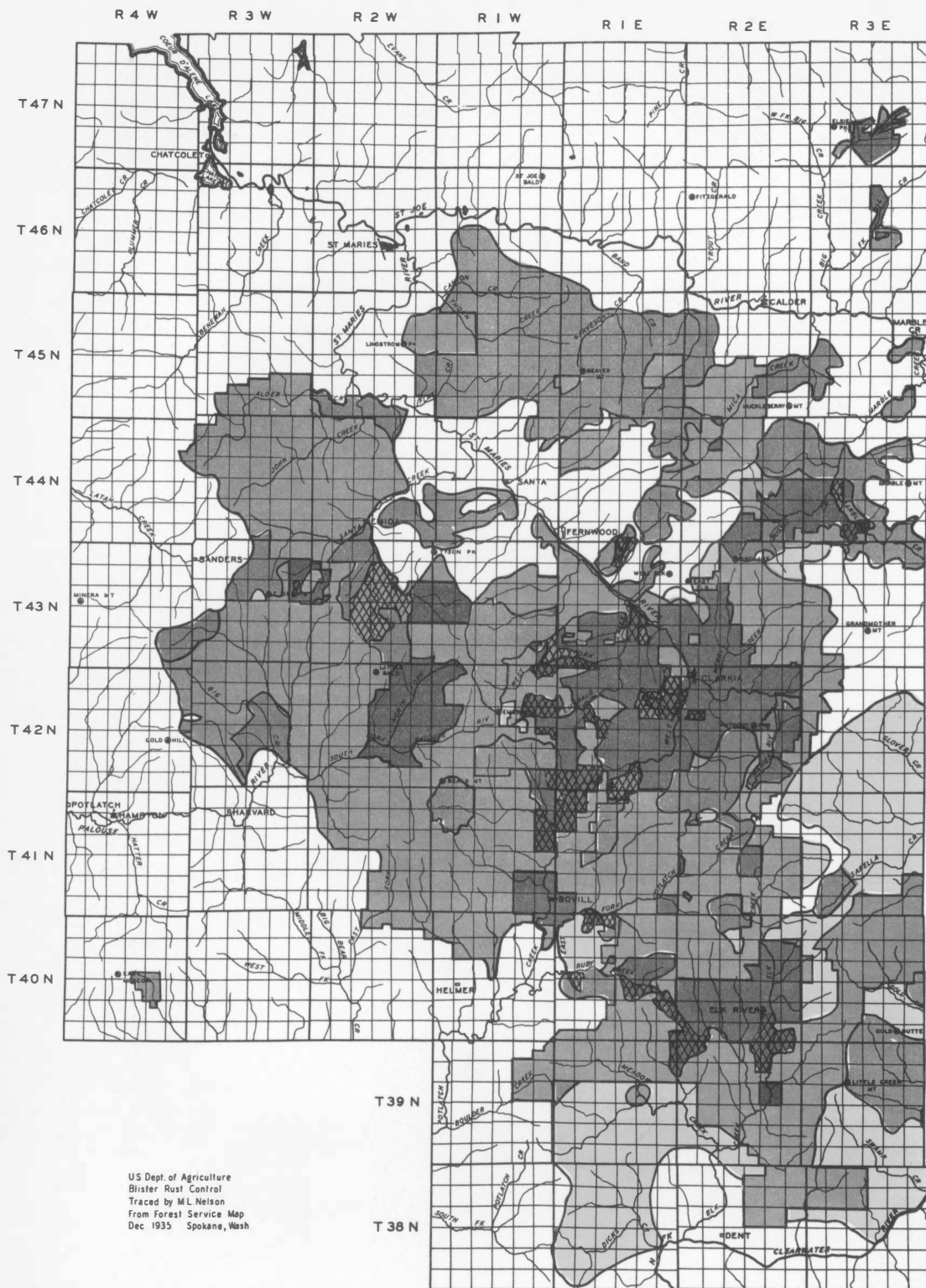
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1941
CLEARWATER OPERATION

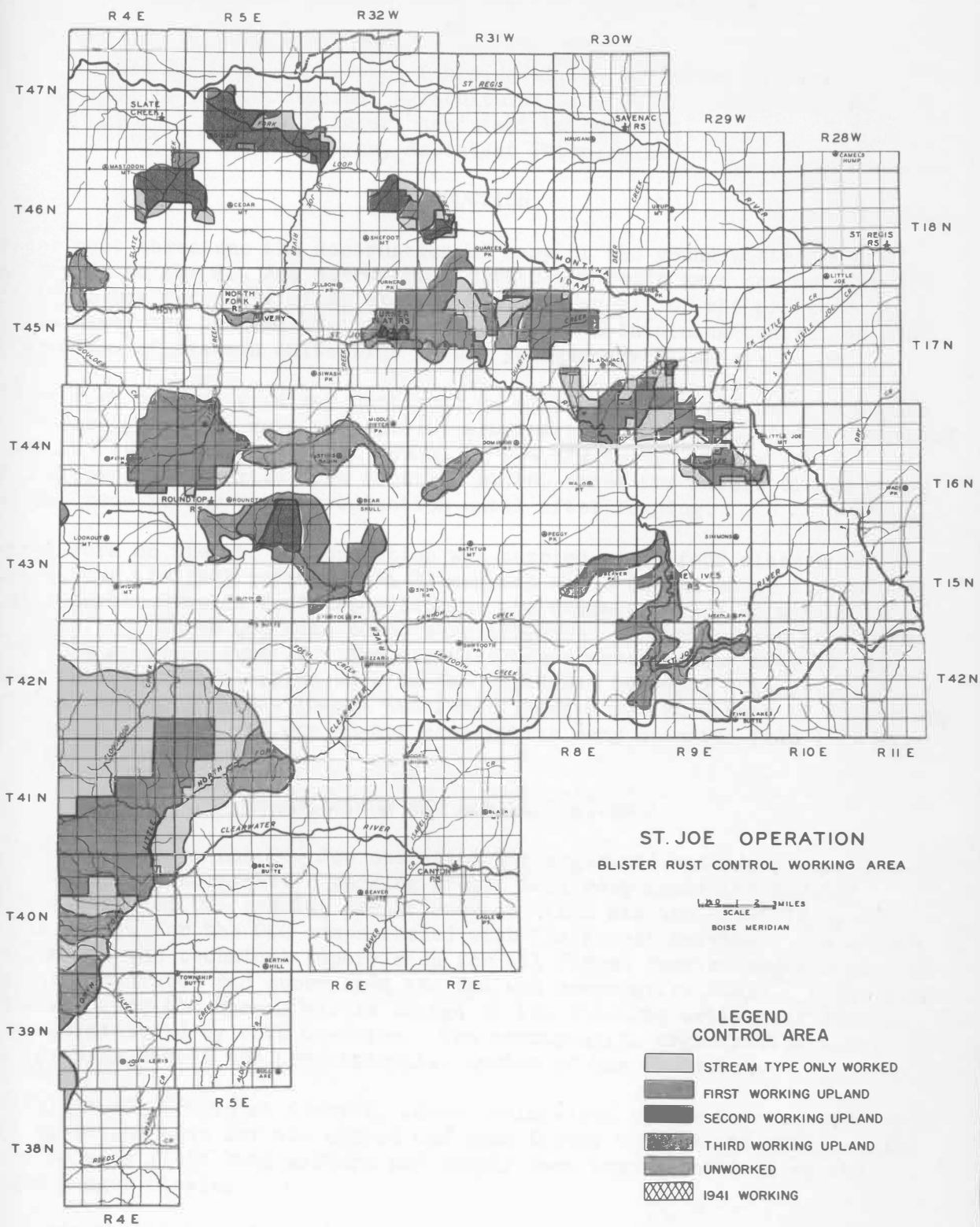
Ownership Class	Number of Acres			Acres Mature Stands on Which Working Is Deferred	Total Acres White Pine
	Worked	Unworked	Total		
Forest Service	148,186	47,684	195,870	8,860	204,730
Public Domain	3,680	350	4,030		4,030
Subtotal Federal	151,866	48,034	199,900	8,860	208,760
State	78,834	2,956	81,790	11,200	92,990
Private	162,600	17,710	180,310	27,940	208,250
Total	393,300	68,700	462,000	48,000	510,000

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1929-1941
CLEARWATER OPERATION

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Open Reproduction	58,463	7,585,779	24,149,751	73,506	41,600	115,547		31,966,133
	Dense Reproduction	11,088	157,346	980,480	2,457	5,726	15,584		1,161,593
	Open Pole	25,677	2,340,591	1,221,117	31,301	6	7,090	462	3,600,567
	Dense Pole	3,534	127,043	57,703	316				185,062
	Open Mature	213,980	16,156,577	6,773,065	197,117	107,057	57,641	26	23,291,483
	Dense Mature	5,309	104,873	22,438	715	865	1,980		130,871
	Cutover	27,726	2,100,601	8,431,923	38,603	27,752	11,210		10,610,089
	Brush	2,795	210,516	490,931	17,270	114	10,416		729,247
	Burn	1,045	74,796	838,377	568		3,868		917,609
	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,890							
	All Upland	351,629	28,911,622	42,966,233	361,853	183,120	223,336	488	72,646,652
	Stream	41,671	9,861,025	324,255	2,683,146	701,834	25,394		13,595,654
	All Types	393,300	38,772,647	43,290,488	3,044,999	884,954	248,730	488	86,242,306
Second	Open Reproduction	20,460	693,076	2,433,398	12,007	4	36		3,138,521
	Dense Reproduction	493	102	3,192	4				3,298
	Open Pole	11,284	395,523	518,636	12,653	1	250		927,063
	Dense Pole	1,569	101,801	2,734	3,376				107,911
	Open Mature	15,743	392,150	400,158	15,768	116		267	808,459
	Dense Mature	324	3,058	315					3,373
	Cutover	32,345	1,131,459	8,554,796	77,458	724	7,697		9,772,134
	Brush	79	424	2,962					3,386
	Burn	432	19,437	342,837	5,447				367,721
	All Upland	82,729	2,737,030	12,259,028	126,713	845	7,983	267	15,131,866
	Stream	23,614	1,882,577	516,470	821,946	76,716	9,141	6,676	3,313,526
	All Types	106,343	4,619,607	12,775,498	948,659	77,561	17,124	6,943	18,445,392
	Open Reproduction	2,324	126,520	118,555	1,934		14		247,023
	Cutover	6,002	123,762	665,269	14,519		143		803,693
Third	All Upland	8,326	250,282	783,824	16,453		157		1,050,716
	Stream	2,174	178,214	2,038	46,968	22,816			250,036
	All Types	10,500	428,496	785,862	63,421	22,816	157		1,300,752
	Open Reproduction	81,247	8,405,375	26,701,704	87,447	41,604	115,597		35,351,727
	Dense Reproduction	11,581	157,448	983,672	2,461	5,726	15,584		1,164,891
All Workings	Open Pole	36,961	2,736,114	1,739,753	43,954	7	7,340	462	4,527,630
	Dense Pole	5,103	228,844	60,437	3,692				292,973
	Open Mature	229,723	16,548,727	7,173,223	212,885	107,173	57,641	293	24,099,942
	Dense Mature	5,633	107,931	22,753	715	865	1,980		134,244
	Cutover	66,073	3,355,822	17,651,988	130,580	28,476	19,050		21,185,916
	Brush	2,874	210,940	493,893	17,270	114	10,416		732,633
	Burn	1,477	94,233	1,181,214	6,015		3,868		1,285,330
	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,890							
	All Upland	442,684	31,898,934	56,009,085	505,019	183,965	231,476	755	88,829,234
	Stream	67,459	11,921,816	842,763	3,552,060	801,366	34,535	6,676	17,159,216
	All Types	510,143	43,820,750	56,851,848	4,057,079	985,331	266,011	7,431	105,988,450





BLISTER RUST CONTROL WORK, ST. JOE OPERATION, 1941

By

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INTRODUCTION

Blister rust threatens the destruction of many of the young western white pine stands on the St. Joe operation. Sufficient funds have not been available to do the necessary ribes eradication work on all of the areas so efforts have been concentrated on completing and maintaining control on the better areas of western white pine in the younger age classes.

Blister rust control work was continued on this operation for the thirteenth consecutive year. To date the initial eradication of ribes has been completed on 535,867 acres and subsequent rework on 134,639 acres. There remain 349,058 acres of unworked area of which 90,460 acres are mature timber which will not require any ribes eradication until after logging.

Control work on the St. Joe operation was carried on by four classes of camps during the 1941 season. Ten 33-man and three 66-man camps financed by regular Forest Service funds operated for the average period of May 25 to September 10. Three CCC main camps were scheduled to participate in control activities starting June 15. Two of these camps were discontinued in mid-summer and ribes eradication work in the third was hampered materially by depleted enrollment. One 15-man ERA camp financed by the Bureau of Entomology and Plant Quarantine and one 66-man cooperative camp operated from late May until early September.

ORGANIZATION AND ADMINISTRATION

All control work on the St. Joe operation was organized and administered according to the cooperative working plan. Full responsibility for the administration of the regular Forest Service camps and the supervision of the field work for the CCC camps rested with the Forest Service. The Bureau administered the technical supervision for all Forest Service regular and CCC camps, and operated and supervised the ERA and cooperative camps. A checking supervisor from the Bureau was in charge of the checking activities for all camps administered by both agencies. The accompanying organization chart sets forth in detail the administrative system of the operation.

The field headquarters at Clarkia, Idaho, maintained by the Bureau, were used as an operating base for all Bureau and some Forest Service activities. The Forest Service field headquarters and supply base were maintained at the Clarkia Ranger Station.

To provide the best available class of labor in the Forest Service regular camps, former employees whose services were satisfactory during the past year were sent application forms. Applicants who indicated that they would be

available were called directly by name. About 50 per cent of this group failed to report when called. Inexperienced men were obtained from applicants interviewed by responsible members of the operation and through the State Employment Service. Nearly 70 per cent of the men employed were inexperienced. As the season progressed, the labor turnover increased and the quality of available labor greatly decreased. Many older men and boys of 17 and 18 years of age were employed, and on the average the quality of the workers was lower than in any previous season.

Many crew leaders and laborers were transferred to ranger districts of the St. Joe National Forest for fire guard and lookout duty. The labor turnover, amounting to more than 100 per cent, caused a great amount of added expense and lost motion. The very heavy rains which fell throughout May, June and September greatly aggravated the personnel problem and delayed field work.

The average age of the men employed in the cooperative camp was 18 years, and work was a new experience for all. On an average it required one month of training and conditioning for each man before satisfactory production was reached. These men will be very desirable workers next season.

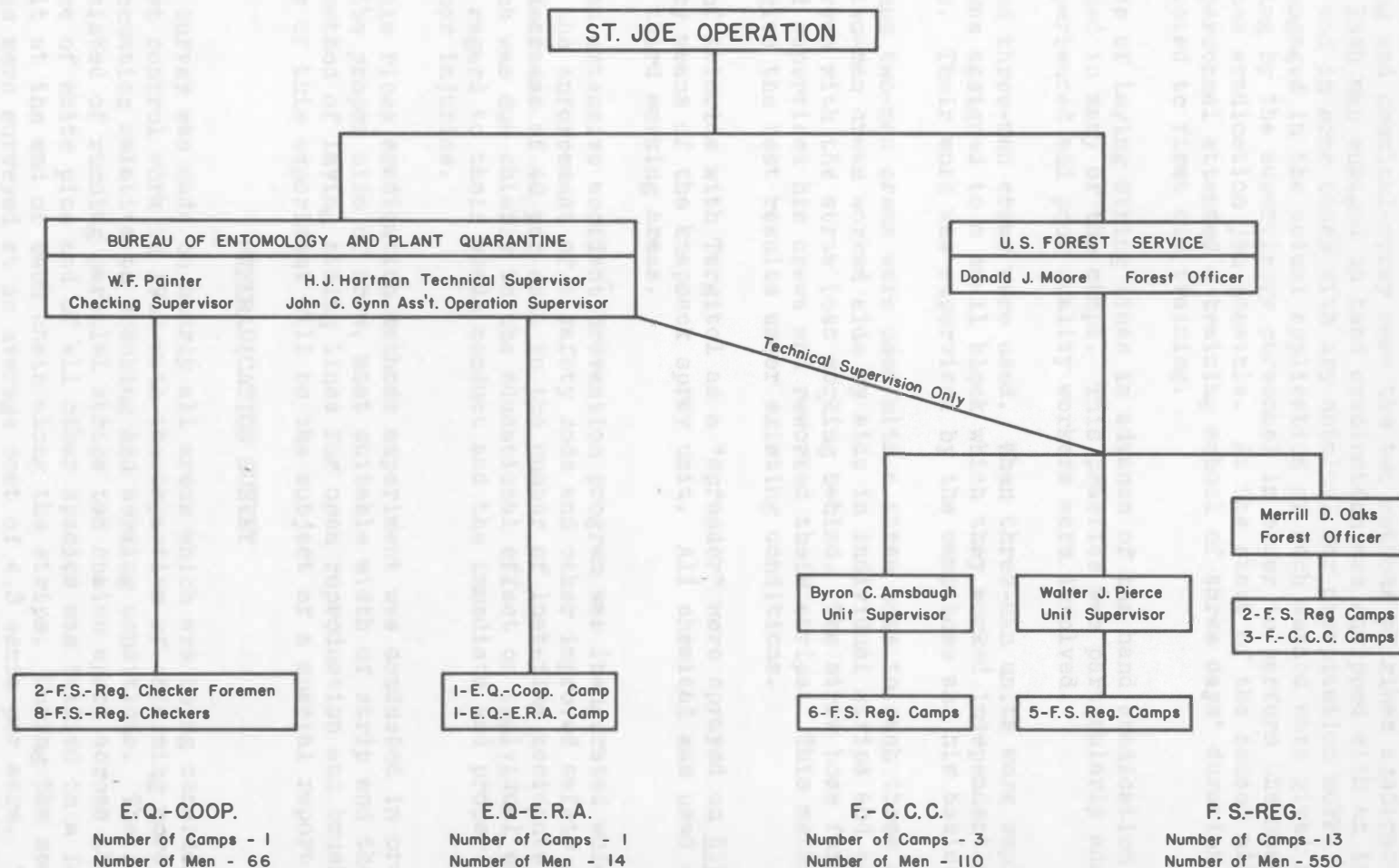
All blister rust control personnel were trained and organized for fire suppression work.

LOCATION AND DESCRIPTION OF AREAS

Large-scale western white pine logging operations continue in the St. Joe and Clearwater regions. There are eight major western white pine logging operations and numerous small ones within the control boundaries of the St. Joe operation. Nearly one-half of these cuttings are taking place on areas that have been protected from blister rust. In a few cases 60 year old stands of private timber are being logged by small operators. On many of the logging operations the readily accessible mixed species of good quality are being harvested along with the western white pine, but in general the cuttings do not open up the forest canopy sufficiently to allow development of western white pine reproduction. However, an abundant and flourishing ribes population usually develops and heavy blister rust infection soon occurs. No attempt has been made to establish control on any areas logged since 1932, as these areas usually represent very high cost control work and their western white pine productivity is very questionable due to the heavy residual stand of inferior species. The majority of these areas have been set aside until partial disposal of defective and unmerchantable species or additional logging has taken place.

All control efforts in 1941 were concentrated on the protection of high-quality, well-established pole and reproduction stands. Broadly speaking, the ribes population on these areas had reached a state of equilibrium. The first working areas average 255 ribes per acre while the second working areas averaged 58 ribes per acre. The majority of the camps were engaged on second eradication. Only five camps were employed on initial ribes eradication work which was chiefly confined to western white pine plantations. Areas included in the 1941 control program were in the St. Maries River and the Marble, Potlatch and Elk Creek drainages.

ORGANIZATION CHART



Total Number of Men on Blister Rust Work - 740

METHODS AND EQUIPMENT

Hand pulling and chemical-spray were the two methods of ribes eradication employed. Each man engaged on hand eradication was equipped with an improved ribes pick and in some cases with dry chemical for decapitation work. All employees engaged in the actual application of each method were given intensive training by the supervisory personnel in order to perform the most efficient ribes eradication job possible. At the start of the season all supervisory personnel attended a training school of three days' duration. One day was devoted to first aid training.

The practice of laying string lines in advance of the hand eradication crews was continued in many of the camps. This practice was particularly adaptable where inexperienced and poor quality workers were involved.

Both two and three-man crews were used. When three-man units were employed each crew was assigned to a small block which they worked independently of other crews. Their work was supervised by the camp boss and his assistant.

In most camps two-man crews were used with a straw boss to each three crews. The three two-man crews worked side by side in individual strips and as individual crews with the straw boss working behind. The straw boss further trained and supervised his crews and reworked their strips. This method appeared to give the best results under existing conditions.

Five tons of Atlacide with Tergitol as a "spreader" were sprayed on Ribes petiolare by means of the knapsack spray unit. All chemical was used on second and third working areas.

This year an extensive accident prevention program was inaugurated which called for the enforcement of a safety code and other improved safety practices. A decrease of 40 per cent in the number of lost-time accidents resulted which was due chiefly to the educational effect on individual employees in regard to their woods conduct and the immediate and proper treatment of minor injuries.

A large-scale ribes eradication methods experiment was conducted in order to determine the proper size of crew, most suitable width of strip and the most practical method of laying string lines for open reproduction and brush types. The results of this experiment will be the subject of a special report.

PREERADICATION SURVEY

A stocking survey was made on nearly all areas which are being considered for blister rust control work in 1942 with the objective of obtaining more detailed information relative to stocking and working conditions. The field method consisted of running parallel strips ten chains apart across the areas. The presence of white pine and of all other species was tallied on a four-milacre unit at the end of each chain along the strips. During the season 49,000 acres were surveyed at an average cost of 4.3 cents per acre. The survey was financed from regular Forest Service funds. These data will be used in blister rust control and silvicultural planning.

CHECKING AND PINE DISEASE SURVEY

The checking of ribes eradication areas was continued during 1941 with no deviation from the standard checking methods practiced in 1940. To maintain a high quality of check on worked areas, checkers were systematically checked throughout the summer.

Six checkers of the 17 who checked in 1940 returned for the 1941 season. Four more were trained and additional men would have been trained if qualified material had been available. By mid-August the organization consisted of six checkers and one checker foreman for 18 camps. In spite of the shortage of checkers, areas were checked with the same degree of efficiency regardless of the amount of area available for checking. The constant need of men for regular check limited post check activities to areas included in the 1941 work plan. A total of 24,583 acres was covered by a regular check at a cost of \$0.17 per acre. A total of 10,953 acres was post checked at a cost of \$0.09 per acre.

In addition to the regular checking activities pine disease survey became an added activity of the checking organization in 1941. A three-day training school was conducted at Clarkia, Idaho in July, during which R. L. MacLeod outlined the general methods and procedure for disease survey and assisted in the practice field work. Three checkers, who were to be the nucleus of the disease survey crew, were trained during this period. In September when checking work was discontinued two disease survey crews of three men each were organized. The work was confined to areas not previously surveyed and plantation areas.

Results of the disease survey work and other pertinent data for each area inspected are included in the following summaries:

Ramskull Creek Drainage, T. 43 N., R. 3 W., secs. 13, 24; T. 43 N., R. 2 W., secs. 7, 18, 19.

This drainage was logged in 1928 and 1929 and broadcast burned in 1930. The area was snagged in 1935 and 1936 by CCC's, broadcast burned in the fall of 1936, and planted by CCC's in the spring of 1937 and 1938. An unsatisfactory burn over the upper limits of the drainage made planting conditions quite severe due to the remaining felled snags and heavy brush. Such conditions also made ribes eradication very difficult. The entire snagged area was somewhat spot-planted with white pine on the north slopes and yellow pine on the south slopes. Some spruce was planted along the creek bottoms. The first eradication was performed in 1938 by CCC's. The second eradication by CCC's followed in 1940 due to the large number of ribes seedlings resulting from the burn following snagging. At present most of the area is on a rework status due to the number of seedlings present. The survival of white pine on areas which were heavily burned is excellent, but on the non-burned and heavy brush areas few pine are present. A summary of the disease survey follows:



W 29. Conditions following the logging of a 60 year old western white pine stand near Clarkia, Idaho. All ribes had been removed from this stand but this logging disturbance will cause light ribes regeneration from stored seed.



W 148. Typical 66-man blister rust control camp. Cooperative camp at Squaw Meadows in 1941.



W 1606, 1606-6. Two pictures of the same western white pine natural reproduction stand showing the ecological change that has taken place in only six growing seasons (1935-1941). The density of the stand will soon be sufficient to preclude the occurrence and reproduction of ribes.

Acres surveyed in drainage	700
Miles of survey strip	7
Number of trees examined	4,126
Number of trees infected	69
Per cent trees infected	1.7
Number of cankers found	78

With the exception of 14 trees all infection found in the drainage was on small pine reproduction that survived the fire following snagging. Trunk cankers prevail, and there is reason to believe that few infected trees will survive.

Charlie Creek Drainage, T. 43 N., R. 2 W., secs. 10, 15, 16, 21, 23.

The area was logged from 1926 to 1928 and broadcast burned in 1928 or 1929. Snagging of the area was started by the CCC's in the fall of 1939 and continued in the spring of 1940. The felled snags were never burned. Planting of all of the area snagged was not necessary due to a sufficient amount of reproduction that became established following the burn in 1928 or 1929. However, 435 acres were planted to western white pine in the fall of 1940 and 933 acres in the spring of 1941.

Two regular Forest Service camps, a 33-man and one 66-man, were established in the drainage in 1941 to cover the areas of natural reproduction and the planted areas. The final check on worked areas indicated that six bushes with 11 feet of live stem per acre remained. A summary of the disease survey follows:

Acres surveyed in drainage	900
Miles of survey strip	10
Number of trees examined	4,171
Number of trees infected	61
Per cent trees infected	1.5
Number of cankers found	74

East Fork of Potlatch Creek, T. 41 N., R. 1 E., secs. 33, 34; T. 40 N., R. 1 E., secs. 3, 4, 5.

This area was burned for the second time in 1929. No information is available as to the date of the first burn, but it is assumed it followed logging. The area was planted in the fall of 1933. The survival of planted trees was satisfactory following the second inspection in September, 1936. Approximately one-half of the area was eradicated of ribes in 1934. The reworking of this area plus the initial working of additional area was performed in 1941. An analysis of the disease survey follows:

Acres surveyed in drainage	550
Miles of survey strip	6
Number of trees examined	3,437
Number of trees infected	267
Per cent trees infected	7.8
Number of cankers found	384

Keeler Creek Drainage, T. 41 N., R. 1 E., secs. 3, 4; T. 42 N., R. 1 E., secs. 34, 35

Except for the lower portion of this drainage all cover is natural reproduction, fairly well stocked. The lower portion of the drainage, which represents about one third of the area surveyed, was planted in 1934. The west half of the drainage was spot logged in 1937, the white pine being removed. A semi-broadcast burn followed logging. Ribes eradication was performed in the drainage in 1933, 1938 and 1941. The final check for areas worked in 1941 indicated that four bushes and six feet of live stem per acre remained on the upland type with 15 bushes and 43 feet of live stem per acre on the stream. A summary of the disease survey follows:

Acres surveyed in drainage	800
Miles of survey strip	9
Number of trees examined	6,189
Number of trees infected	459
Per cent trees infected	7.4
Number of cankers found	608

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables by the cooperative agency and the type of appropriation:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941 ST. JOE OPERATION

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	\$204,583.53
	Regular	12,725.26
Bureau of Entomology and Plant Quarantine	Regular-Coop.	2,600.25
	Idaho-ERA	15,097.00
	Total	30,422.51
Idaho PTPA	State	2,921.22
	Private	5,107.46
	Total	8,028.68
All Agencies	Total	\$243,034.72

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941
ST. JOE OPERATION

Item	Forest Service	Bureau of Entomology and Plant Quarantine			Contributed Funds	Total
	Regular	Regular	ERA	Total	Idaho and PTPA	
Salaries, permanent men	\$ 6,440.00	\$ 8,533.30		\$ 8,533.30		\$ 14,973.30
Salaries, temporary men	*		\$ 2,965.66	2,965.66		2,965.66
Wages, temporary laborers	150,909.91	2,384.84	7,091.07	9,475.91	\$8,028.68	168,414.50
Subsistence supplies	33,974.16	3,253.44	2,849.91	6,103.35		40,077.51
Equipment	7,339.47	27.15	111.70	138.85		7,478.32
Travel and transportation	1,701.96	372.67	855.71	1,228.38		2,930.34
Chemicals	1,204.97					1,204.97
Twine	2,189.86					2,189.86
Other supplies	823.20	754.11	1,222.95	1,977.06		2,800.26
Total	\$204,583.53	\$15,325.51	\$15,097.00	\$30,422.51	\$8,028.68	\$243,034.72

*Included with wages, temporary laborers

TABLE 2A

DISTRIBUTION OF BLISTER RUST CONTROL EXPENDITURES BY PROGRAMS
ST. JOE OPERATION

Program	Number of Effective Man-Days	Expenditures According to Fund		Effective Man-Day Cost
Planning, Coordination, and Technical Direction		EQ-Reg.	\$ 6,244.98	
FS-Reg.	26,046	FS-Reg.	203,425.35	\$7.81
Cooperative	2,704	Idaho	2,921.22	6.24
		PTPA	5,107.46	
		EQ-Reg.	6,250.28	
		EQ-Reg.-Coop.	2,600.25	
		Total	16,879.21	
EQ-ERA	281	EQ-ERA	1,826.50	7.32
		EQ-Reg.	230.00	
		Total	2,056.50	
CCC	2,683	*FS-Reg.	1,158.18	
EQ-ERA, Winter Project		EQ-ERA	13,270.50	
Total Cost of 1941 Program			\$243,034.72	

*CCC funds not included

	<u>Forest Service</u>	<u>Bureau</u>
Number of meals served	134,313	27,491
Average cost per meal	\$0.253	\$0.222
Pounds of twine used	6,144	980
Pounds of chemical used	10,360	200

SUMMARY OF RIBES ERADICATION, 1941
ST. JOE OPERATION

TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
								Bushes	Live Stem
Open Reproduction	4,152	10,333	2,724	17,209	23,907	2,061,453		6	17
Dense Reproduction	47	930	44	1,021	432	14,991		4	20
Open Pole	200	3,162	539	3,901	2,258	69,982		3	11
Dense Pole	502	160		662	48	584		1	1
Open Mature	20	450	117	587	882	87,848		6	11
Cutover		164	230	394	697	67,580		3	4
All Upland	4,921	15,199	3,654	23,774	28,224	2,302,438		5	16
Stream (Hand)	114	453	242	809	3,098	228,220		18	46
Stream (Chemical)	20	228	113	361	392	23,037	7,679		
All Stream	114	453	242	809	3,490	251,257		18	46
All Types	5,035	15,652	3,896	24,583	31,714	2,553,695		6	16

TABLE 3A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
					Man- Days	Ribes	Gallons Spray	Bushes	Live Stem
Open Reproduction	4,152	6,969	1,112,215		1.68	268		8	15
Dense Reproduction	47	50	3,668		1.06	78		4	10
Open Pole	200	39	6,252		.20	31		7	13
Dense Pole	502	2	197		.01	1		0	0
Open Mature	20	66	8,803		3.30	440		0	0
All Upland	4,921	7,126	1,131,135		1.45	230		7	15
Stream (Hand)	114	1,491	150,209		13.08	1,318		21	29
Stream (Chemical)	20	78	2,025	675	3.90	101	34		
All Stream	114	1,569	152,234		13.76	1,335		21	29
All Types	5,035	8,695	1,283,369		1.73	255		8	15

TABLE 3B - SECOND WORKING

Open Reproduction	10,333	12,476	732,805		1.21	71		6	18
Dense Reproduction	930	381	11,313		.41	12		4	21
Open Pole	3,162	1,986	59,309		.63	19		3	11
Dense Pole	160	46	387		.29	2		1	1
Open Mature	450	526	44,465		1.17	99		6	11
Cutover	164	158	6,119		.96	37		1	3
All Upland	15,199	15,573	854,398		1.02	56		5	16
Stream (Hand)	453	769	44,391		1.70	98		19	41
Stream (Chemical)	228	209	12,855	4,285	.92	56	19		
All Stream	453	978	57,246		2.16	126		19	41
All Types	15,652	16,551	911,644		1.06	58		5	16

TABLE 3C - THIRD WORKING

Open Reproduction	2,724	4,462	216,433		1.64	79		6	16
Dense Reproduction	44	1	10		.02	1		0	0
Open Pole	539	233	4,421		.43	8		5	7
Open Mature	117	290	34,580		2.48	296		0	0
Cutover	230	539	61,461		2.34	267		3	4
All Upland	3,654	5,525	316,905		1.51	87		6	14
Stream (Hand)	242	838	33,620		3.46	139		14	42
Stream (Chemical)	113	105	8,157	2,719	.93	72	24		
All Stream	242	943	41,777		3.90	173		14	42
All Types	3,896	6,468	358,682		1.66	92		6	15

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941
ST. JOE OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man- Days	Ribes	Gallons Per Sprayed Area	Bushes	Live Stem
First	FS-Reg.	4,679	7,153	1,169,344		1.53	250		8	15
	F-CCC	356	1,542	114,025	675	4.33	320	34	10	33
	Total	5,035	8,695	1,283,369	675	1.73	255	34	8	15
Second	EQ-ERA	214	281	19,090		1.31	89		4	25
	FS-Reg.	12,634	13,289	738,476	4,285	1.05	58	19	4	14
	EQ-Coop.	2,651	2,704	120,704		1.02	46		4	12
	F-CCC	153	277	33,374		1.81	218		10	31
	Total	15,652	16,551	911,644	4,285	1.06	58	19	5	16
Third	FS-Reg.	3,658	5,604	275,672	2,719	1.53	75	24	5	13
	F-CCC	238	864	83,010		3.63	349		13	35
	Total	3,896	6,468	358,682	2,719	1.66	92	24		
All Workings	EQ-ERA	214	281	19,090		1.31	89		4	25
	FS-Reg.	20,971	26,046	2,183,492	7,004	1.24	104	21	5	14
	EQ-Coop.	2,651	2,704	120,704		1.02	46		4	12
	F-CCC	747	2,683	230,409	675	3.59	308	34	10	32
	Total	24,583	31,714	2,553,695	7,679	1.29	104	21	6	16

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941
ST. JOE OPERATION

State	Working	Number of Acres Worked															Total
		By Forest Service					By Bureau of Entomology and Plant Quarantine					Total					
		Federal			State	Private	Federal			State	Private	Federal			State	Private	
		Forest Service	Public Domain	Total			Forest Service	Public Domain	Total			Forest Service	Public Domain	Total			
Idaho	First	4,458		4,458	275	302						4,458		4,458	275	302	5,035
	Second	8,786	200	8,986	1,105	2,696	864	80	944	1,075	846	9,650	280	9,930	2,180	3,542	15,652
	Third	1,951		1,951	618	1,327						1,951		1,951	618	1,327	3,896
	Total	15,195	200	15,395	1,998	4,325	864	80	944	1,075	846	16,059	280	16,339	3,073	5,171	24,583

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
ST. JOE OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	
First	Open Reproduction	4,152	292,174	807,604	115	11,870	452	1,112,215
	Dense Reproduction	47	709	2,941		18		3,668
	Open Pole	200	2,064	4,188				6,252
	Dense Pole	502	125	72				197
	Open Mature	20	6,011				2,792	8,803
	All Upland	4,921	301,083	814,805	115	11,888	3,244	1,131,135
	Stream	114	130,981	8,055	2,025	11,173		152,234
	All Types	5,035	432,064	822,860	2,140	23,061	3,244	1,283,369
	Open Reproduction	10,333	230,632	484,045	2,791	8,636	6,701	732,805
	Dense Reproduction	930	8,773	2,526	14			11,313
Second	Open Pole	3,162	40,731	13,645	400	4,529	4	59,309
	Dense Pole	160	271	116				387
	Open Mature	450	31,680	3,374	460		8,951	44,465
	Cutover	164	3,591	2,371	17	140		6,119
	All Upland	15,199	315,678	506,077	3,682	13,305	15,656	854,398
	Stream	453	30,931	845	14,202	11,268		57,246
	All Types	15,652	346,609	506,922	17,884	24,573	15,656	911,644
	Open Reproduction	2,724	39,807	169,933	202	6,491		216,433
	Dense Reproduction	44	9	1				10
	Open Pole	539	828	3,519	21	53		4,421
Third	Open Mature	117	32,812	32	8		1,728	34,580
	Cutover	230	15,343	43,297		2,821		61,461
	All Upland	3,654	88,799	216,782	231	9,365	1,728	316,905
	Stream	242	29,955	84	9,558	2,180		41,777
	All Types	3,896	118,754	216,866	9,789	11,545	1,728	358,682
	Open Reproduction	17,209	562,613	1,461,582	3,108	26,997	7,153	2,061,453
All Workings	Dense Reproduction	1,021	9,491	5,468	14	18		14,991
	Open Pole	3,901	43,623	21,352	421	4,582	4	69,982
	Dense Pole	662	396	188				584
	Open Mature	587	70,503	3,406	468		13,471	87,848
	Cutover	394	18,934	45,668	17	2,961		67,580
	All Upland	23,774	705,560	1,537,664	4,028	34,558	20,628	2,302,438
	Stream	809	191,867	8,984	25,785	24,621		251,257
	All Types	24,583	897,427	1,546,648	29,813	59,179	20,628	2,553,695

SUMMARY OF RIBES ERADICATION, 1929-1941
ST. JOE OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Gallons Spray
Open Reproduction	172,579	66,517	5,703	244,799	321,028	87,701,601	
Dense Reproduction	43,037	4,335	79	47,451	13,083	1,908,977	
Open Pole	63,538	23,940	1,098	88,576	42,798	7,799,578	
Dense Pole	23,300	2,438		25,738	5,501	985,353	
Open Mature	182,314	10,113	170	192,597	85,450	22,547,209	
Dense Mature	9,745	274		10,019	1,614	267,557	
Cutover	1,009	344	230	1,583	1,561	331,297	
Brush	2,452	431		2,883	1,924	679,187	
Burn	2,224	106		2,330	1,164	806,886	
Subalpine	200			200	416	90,809	
All Upland	500,398	108,498	7,280	616,176	474,539	123,118,454	
Stream (Hand)	34,678	12,602	6,232	53,512	97,334	27,328,357	
Stream (Chemical)	7,404	3,237	606	11,247	26,892	2,385,780	795,260
Stream (Slash)	791	27		818	10,420	409,100	
All Stream	35,469	12,629	6,232	54,330	134,646	30,123,257	
All Types	535,867	121,127	13,512	670,506	609,185	153,241,691	

TABLE 7A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis		
					Man- Days	Ribes	Gallons Spray
Open Reproduction	172,579	230,200	78,656,361		1.33	456	
Dense Reproduction	43,037	11,113	1,748,192		.26	41	
Open Pole	63,538	28,504	6,864,339		.45	108	
Dense Pole	23,300	4,578	915,716		.20	39	
Open Mature	182,314	77,084	21,433,378		.42	118	
Dense Mature	9,745	1,559	255,434		.16	26	
Cutover	1,009	654	100,332		.65	99	
Brush	2,452	1,881	676,620		.77	276	
Burn	2,224	1,061	795,464		.48	358	
Subalpine	200	416	90,809		2.08	454	
All Upland	500,398	357,050	111,536,645		.71	223	
Stream (Hand)	34,678	65,337	20,953,990		1.88	604	
Stream (Chemical)	7,404	21,683	2,009,118	669,706	2.93	271	90
Stream (Slash)	791	10,101	395,600		12.77	500	
All Stream	35,469	97,121	23,358,708		2.74	659	
All Types	535,867	454,171	134,895,353		.85	252	

TABLE 7B - SECOND WORKING

Open Reproduction	66,517	83,078	8,693,396		1.25	131	
Dense Reproduction	4,335	1,898	159,643		.44	37	
Open Pole	23,940	13,745	916,626		.57	38	
Dense Pole	2,438	923	69,637		.38	29	
Open Mature	10,113	8,041	1,075,789		.80	106	
Dense Mature	274	55	12,123		.20	44	
Cutover	344	368	169,504		1.07	493	
Brush	431	43	2,567		.10	6	
Burn	106	103	11,422		.97	108	
All Upland	108,498	108,254	11,110,707		1.00	102	
Stream (Hand)	12,602	22,389	4,836,114		1.78	384	
Stream (Chemical)	3,237	4,704	333,549	111,183	1.45	103	34
Stream (Slash)	27	319	13,500		11.81	500	
All Stream	12,629	27,412	5,183,163		2.17	410	
All Types	121,127	135,666	16,293,870		1.12	135	

TABLE 7C - THIRD WORKING

Open Reproduction	5,703	7,750	351,844		1.36	62	
Dense Reproduction	79	72	1,142		.91	14	
Open Pole	1,098	549	18,613		.50	17	
Open Mature	170	325	38,042		1.91	224	
Cutover	230	539	61,461		2.34	267	
All Upland	7,280	9,235	471,102		1.27	65	
Stream (Hand)	6,232	9,608	1,538,253		1.54	247	
Stream (Chemical)	606	505	43,113	14,371	.83	71	24
All Stream	6,232	10,113	1,581,366		1.62	254	
All Types	13,512	19,348	2,052,468		1.43	152	

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1941
ST. JOE OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Gallons Spray	Per Acre Basis		
						Man- Days	Ribes	Gallons Per Sprayed Area
First	FS-Reg.	86,489	90,222	26,035,449	262,145	1.04	301	95
	EQ-NIRA	42,366	25,571	7,734,978	10,839	.60	183	68
	FS-NIRA	70,714	44,246	14,845,626	101,476	.63	210	129
	EQ-ERA	147,063	92,678	29,461,510	52,667	.63	200	113
	FS-ERA	267	892	487,480		3.34	1,826	
	EQ-Coop.	17,073	13,484	3,864,001	56,611	.79	226	41
	F-CCC	103,540	136,641	40,639,926	163,378	1.32	393	116
	S&P-CCC	68,355	50,437	11,826,383	22,590	.74	173	53
	Total	535,867	454,171	134,895,553	669,706	.85	252	90
Second	FS-Reg.	58,142	62,792	6,411,756	39,711	1.08	110	25
	EQ-NIRA	1,742	1,228	291,131		.70	167	
	EQ-ERA	40,355	35,499	5,649,828	10,557	.88	140	32
	EQ-Coop.	3,140	2,995	169,179	2,674	.95	54	11
	F-CCC	15,500	28,795	3,316,377	29,289	1.86	214	55
	S&P-CCC	2,248	4,357	455,599	28,952	1.94	203	54
	Total	121,127	135,666	16,293,870	111,183	1.12	135	34
	FS-Reg.	7,920	11,311	944,510	6,849	1.43	119	26
Third	EQ-ERA	2,993	2,922	455,940	3,025	.98	152	12
	F-CCC	2,530	5,053	649,160	4,497	2.00	257	46
	S&P-CCC	69	62	2,858		.90	41	
	Total	13,512	19,348	2,052,468	14,371	1.43	152	24
All Workings	FS-Reg.	152,551	164,325	33,391,715	308,705	1.08	219	67
	EQ-NIRA	44,108	26,799	8,026,109	10,839	.61	182	68
	FS-NIRA	70,714	44,246	14,845,626	101,476	.63	210	129
	EQ-ERA	190,411	131,099	35,567,278	66,249	.69	187	64
	FS-ERA	267	892	487,480		3.34	1,826	
	EQ-Coop.	20,213	16,479	4,033,180	59,285	.82	200	36
	F-CCC	121,570	170,489	44,605,463	197,164	1.40	367	97
	S&P-CCC	70,672	54,856	12,284,840	51,542	.78	174	53
	Total	670,506	609,185	153,241,691	795,260	.91	229	71

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1941
ST. JOE OPERATION

Working	Number of Acres Worked by Ownership Classes					
	Federal			State-Idaho	Private	Total
	Forest Service	Public Domain	Total			
First	216,158	12,578	228,736	67,082	240,049	535,867
Second	65,333	4,644	69,977	14,051	37,099	121,127
Third	7,061	130	7,191	1,383	4,938	13,512
All Workings	288,552	17,352	305,904	82,516	282,086	670,506

TABLE 10

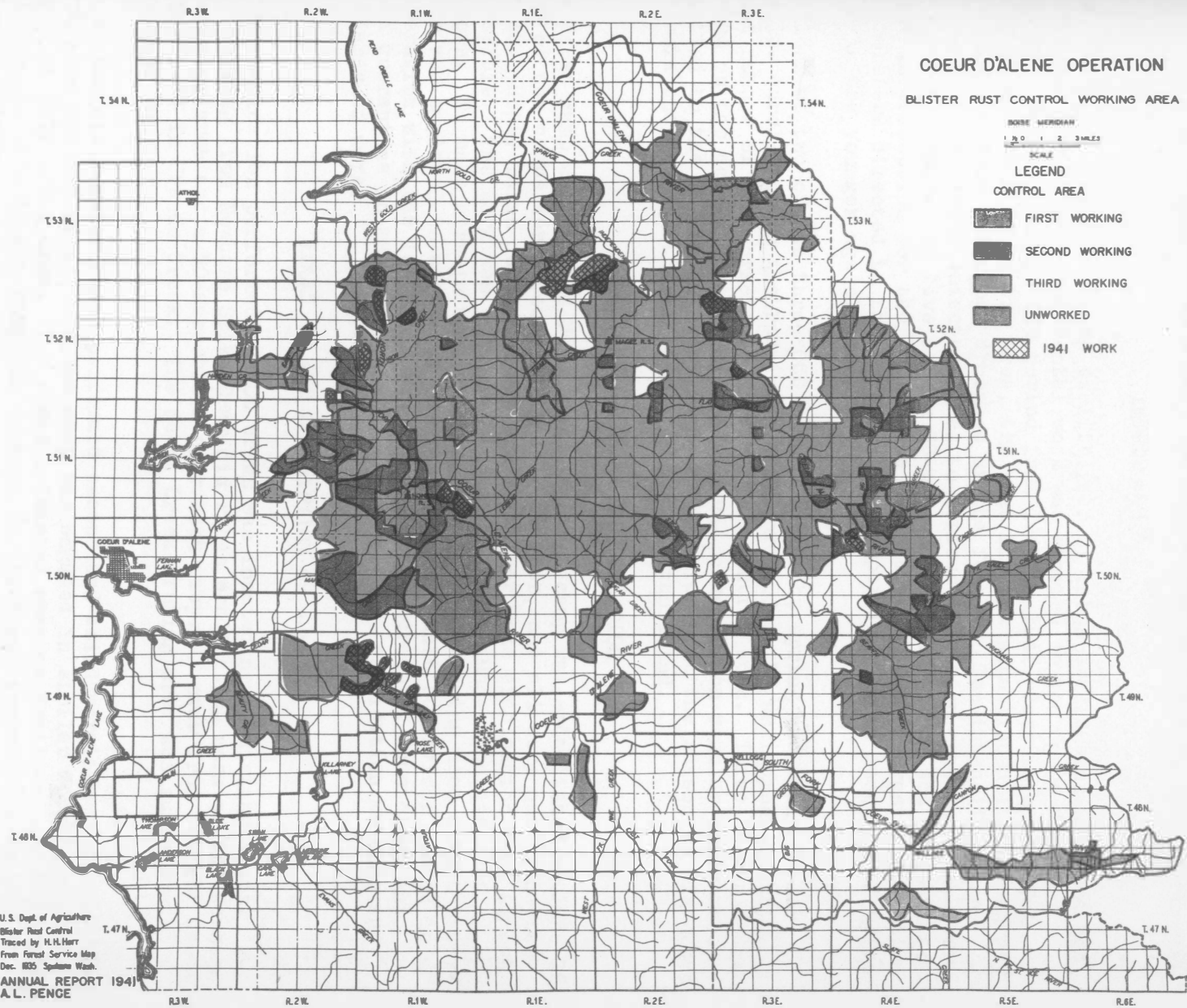
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1941
ST. JOE OPERATION

Ownership Class	Number of Acres			Acres Mature Stands on Which Working Is Deferred	Total Acres White Pine
	Worked	Unworked	Total		
Forest Service	216,158	84,833	300,991	11,089	312,080
Public Domain	12,578	10,847	23,425	1,040	24,465
Subtotal Federal	228,736	95,680	324,416	12,129	336,545
State	67,082	26,973	94,055	20,880	114,935
Private	240,049	135,945	375,994	57,451	433,445
Total	535,867	258,598	794,465	90,460	884,925

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1929-1941
ST. JOE OPERATION

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Open Reproduction	172,579	14,304,910	63,796,019	100,260	316,457	138,715		78,656,361
	Dense Reproduction	43,037	810,571	881,403	13,310	27,305	15,603		1,748,192
	Open Pole	63,538	2,780,166	3,926,050	19,835	61,506	76,782		6,864,339
	Dense Pole	23,300	454,753	457,434	1,335	1,993	201		915,716
	Open Mature	182,314	10,795,826	10,310,260	27,828	42,519	256,945		21,433,378
	Dense Mature	9,745	160,499	94,546	389				255,434
	Cutover	1,009	64,897	30,125	5,269	41			100,332
	Brush	2,452	93,470	579,731	1,987	1,432			676,620
	Burn	2,224	133,557	652,633	8,327	947			795,464
	Subalpine	200	54,975	35,834					90,809
	All Upland	500,398	29,653,624	80,764,035	178,540	452,200	488,246		111,536,645
	Stream	35,469	16,372,384	888,029	3,331,826	2,749,542	16,695	132	23,358,708
	All Types	535,867	46,026,008	81,652,064	3,510,366	3,201,842	504,941	132	134,895,353
Second	Open Reproduction	66,517	3,220,643	5,374,345	34,625	52,205	11,578		8,693,396
	Dense Reproduction	4,335	80,963	78,568	14	98			159,643
	Open Pole	23,940	448,205	449,056	1,719	17,642	4		916,626
	Dense Pole	2,438	37,660	31,393	584				69,637
	Open Mature	10,113	482,507	560,663	778	19	31,822		1,075,789
	Dense Mature	274	4,629	7,494					12,123
	Cutover	344	13,241	156,086	17	160			169,504
	Brush	431	456	2,111					2,567
	Burn	106	5,306	6,116					11,422
	All Upland	108,498	4,293,610	6,665,832	37,737	70,124	43,404		11,110,707
	Stream	12,629	3,038,724	163,110	1,080,316	753,469	6,073	141,471	5,183,163
	All Types	121,127	7,332,334	6,828,942	1,118,053	823,593	49,477	141,471	16,293,870
	Open Reproduction	5,703	132,702	206,489	5,792	6,861			351,844
	Dense Reproduction	79	671	471					1,142
Third	Open Pole	1,098	6,523	11,999	38	53			18,613
	Open Mature	170	32,990	3,316	8		1,728		38,042
	Cutover	230	15,343	43,297		2,821			61,461
	All Upland	7,280	188,229	265,572	5,838	9,735	1,728		471,102
	Stream	6,232	721,817	22,985	464,056	370,126		2,382	1,581,366
	All Types	13,512	910,046	288,557	469,894	379,861	1,728	2,382	2,052,468
	Open Reproduction	244,799	17,658,255	69,376,853	140,677	375,523	150,293		87,701,601
	Dense Reproduction	47,451	892,205	960,442	13,324	27,403	15,603		1,908,977
	Open Pole	88,576	3,234,894	4,387,105	21,592	79,201	76,786		7,799,578
	Dense Pole	25,738	492,413	488,827	1,919	1,993	201		985,353
	Open Mature	192,597	11,311,323	10,874,239	28,614	42,538	290,495		22,547,209
	Dense Mature	10,019	165,128	102,040	389				267,557
	Cutover	1,583	93,481	229,508	5,286	3,022			331,297
All Workings	Brush	2,883	93,926	581,842	1,987	1,432			679,187
	Burn	2,330	138,863	658,749	8,327	947			806,886
	Subalpine	200	54,975	35,834					90,809
	All Upland	616,176	34,135,463	87,695,439	222,115	532,059	533,378		123,118,454
	Stream	54,330	20,132,925	1,074,124	4,876,198	3,873,237	22,768	143,985	30,123,237
	All Types	670,506	54,268,388	88,769,563	5,098,313	4,405,296	556,146	143,985	153,241,691



BLISTER RUST CONTROL WORK, COEUR D'ALENE OPERATION, 1941

By

Neal D. Nelson, Assistant Forest Supervisor, U. S. Forest Service
Albert L. Pence, Jr., Associate Forester

INTRODUCTION

The season of 1941 marked the twelfth year of ribes eradication work and the fifteenth year since experimental work was started on the Coeur d'Alene National Forest. During the period from 1927 to 1941, despite successful control work on much of the area, the rust has now established itself and may be found in every principal drainage of the forest. The intensification varies from scattered infected trees to serious infection centers. The present control program of five or six 33-man camps each year is not adequate to maintain protection for the full white pine acreage of the forest. Attention is therefore directed to the better sites supporting a good stocking of white pine in the younger age classes.

The loss of two of the three CCC camps during the spring and early summer, and low enrollment in the remaining camp, precluded the assignment of any great number of CCC workers to blister rust control work. Three 20-man crews worked on the activity parts of the season. Five 33-man regular camps were allotted to the forest but continuing rains throughout the season so disrupted the work that an additional 15-man camp was established.

ORGANIZATION AND ADMINISTRATION

The first camp was started May 5, and the last camp was established on June 16. Most of the camps were closed early in September, and all were out by September 15. Heavy rains during August and September made eradication work almost impossible. The work was organized and administered under the district rangers. To make certain that uniform practices were being used a unit supervisor was employed to work with the rangers. The unit supervisor worked in cooperation with the Technical Supervisor of the Bureau of Entomology and Plant Quarantine in matters pertaining to checking, eradication methods and standards of work.

LOCATION AND DESCRIPTION OF AREAS

Ribes eradication performed by CCC crews was located near existing camps. A crew working from Nowhere Spike Camp did ribes eradication work on the Nowhere plantation area and a 90-acre block near Rock City. A crew from the Big Creek camp worked in Uranus Creek. The Scott Creek pruning area was subsequently worked in May.

Two of the six regular camps performed second and third workings in the Little North Fork cutover areas, and one camp was engaged in similar work in the Fourth of July Creek area. Two camps initiated work on Trail and Independence Creek areas. The 15-man camp was engaged in first and second work in Owl Creek, a plantation area.

METHODS AND EQUIPMENT

Methods and equipment as prescribed in the "Ribes Eradication Manual" were generally employed.

One, two and three-man crews were used, depending upon the eradication situation encountered and the calibre of the men. One-man crews were used with marked success wherever ground conditions permitted good visibility.

A "contour method" of covering the strip was devised and used for all sizes of crew. This method consists simply of working a 3 to 15 foot contour strip out between the string lines, always on the uphill side of the crew.

Three checkers worked 617 acres on the Nowhere plantation area, expending only 35 man-days and removing an average of five bushes per acre. These men worked abreast on a strip extending three to seven chains wide. The ground was covered by the crew members shuttling back and forth within the strip. This area was worked early in May before other brush species had leafed out, and it is felt that a better job resulted than would have been obtained later using a crew in closer formation.

Equipment consisted of the pronged pick and the Sheeley ribes hook. Each year trucks for transporting men to and from work are becoming more important. Four of the six camps were supplied with trucks for this purpose.

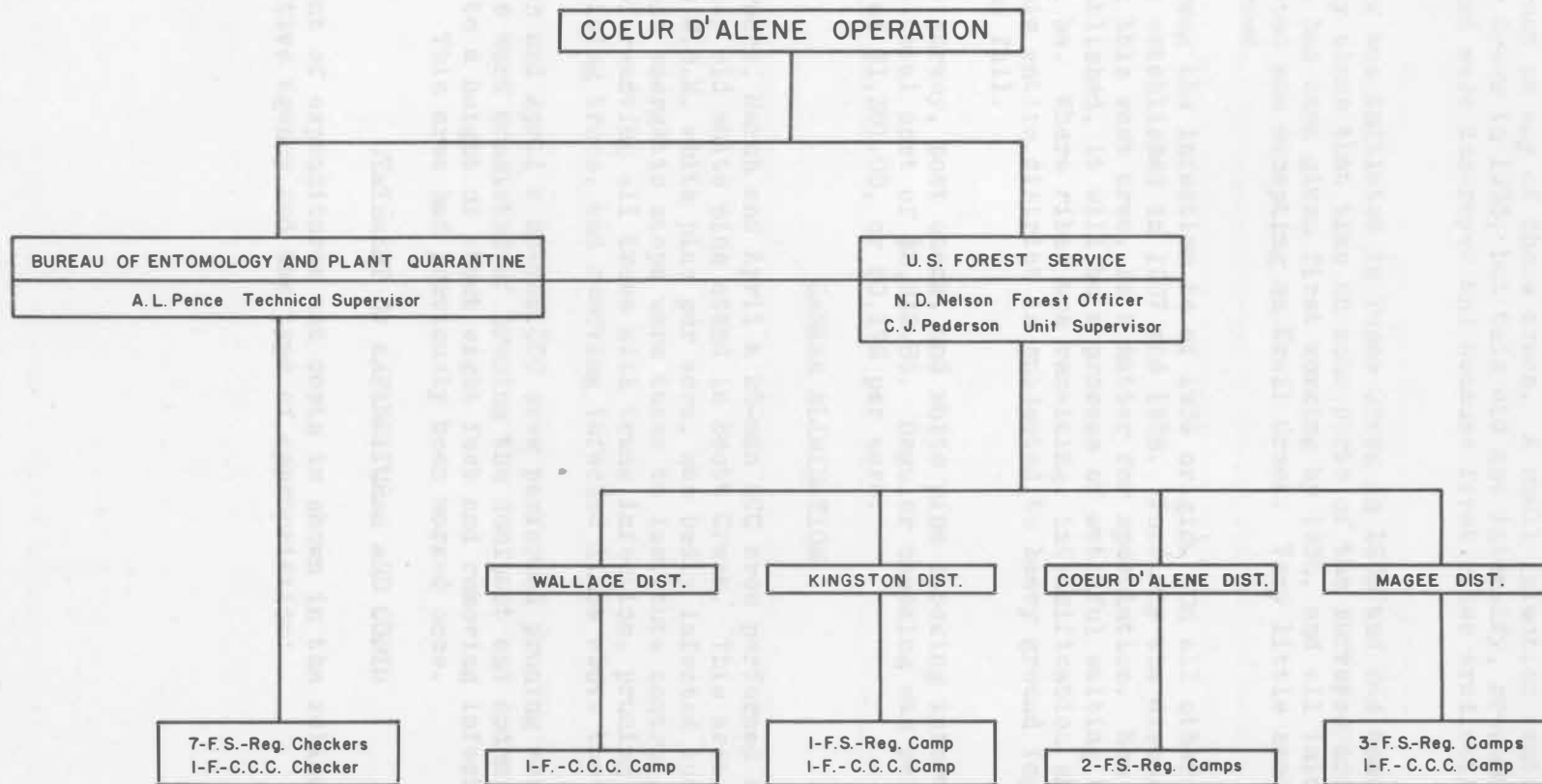
CHECKING AND PINE DISEASE SURVEY

Disease survey work was carried on intermittently during the summer by two 2-man crews of checkers. After the camps were closed, three 2-man crews were used on this assignment for about one month. Prescribed survey methods were used throughout. In addition, stocking data were taken at the end of each chain on a four milacre quadrat basis on those areas where this information was considered desirable.

All of the area covered was within the limits of the Magee Ranger District. The data are representative of approximately 20,000 acres. The disease conditions were found to be so similar for all areas that no attempt will be made to describe them for each drainage in detail. The following table shows the general conditions on each area covered:

Area	Strip Miles	Trees Examined	Trees Infected	Number Cankers	Per Cent Infection	Cankers Per 100 Trees
Jordan	19.3	13,329	13	13	0.10	0.10
Trail	10.2	7,990	37	41	0.46	0.51
East Fork	39.5	16,243	36	41	0.22	0.25
East Teepee	55.3	24,734	54	56	0.22	0.23
West Teepee	53.3	20,181	69	75	0.34	0.37
Van Hoosier	14.5	6,966	42	47	0.60	0.67
Totals	192.1	89,443	251	273	0.28	0.30

ORGANIZATION CHART



F.S.-REG.
Number of Camps - 6
Number of Men - 180

F.-C.C.C.
Number of Camps - 3
Number of Men - 60

Total Number of Men on Blister Rust Work - 240

With the exception of Van Hoosier Creek, this is the first survey that has disclosed rust on any of these areas. A small infection center was found on Van Hoosier Creek in 1933, but this did not intensify, presumably because all cankers found were destroyed and because first ribes eradication was performed in 1935.

Control work was initiated in Tepee Creek in 1933 and has been carried on continuously since that time on some parts of the surveyed areas. The bulk of the area had been given first working by 1936, and all initial work has been completed now excepting on Trail Creek. Very little second work has been performed.

On Trail Creek the infection is of 1939 origin. On all other areas the infection became established in 1937 and 1938. Just why the disease was so slow in entering this vast area, is a matter for speculation. Now that it has become established, it will be a process of watchful waiting to see what its action will be. Where ribes are remaining, intensification should be quite rapid as this entire district is subjected to heavy ground fogs, starting early in the fall.

The disease survey, post check, and white pine stocking information was obtained at a total cost of \$2,942.86. Regular checking was performed at a total cost of \$1,381.05, or \$0.178 per acre.

CANKER ELIMINATION

During February, March and April a 25-man CCC crew performed sanitation work in an 18 year old white pine stand in Scott Creek. This area, which formerly produced 80 M.B.M. white pine per acre, was badly infected and the trees were doomed unless energetic steps were taken to institute control. The work done consisted of removing all trees with trunk infection, pruning the lower crown of the remaining trees, and removing infected limbs above the portion pruned.

During March and April a 25-man CCC crew performed pruning work in Uranus Creek. This work consisted of pruning the dominant and codominant young white pine to a height of about eight feet and removing infected limbs above that point. This area had previously been worked once.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables by the cooperative agency and the type of appropriation:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941
COEUR D'ALENE OPERATION

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	\$77,183.71
Bureau of Entomology and Plant Quarantine	Regular	2,737.49
	Idaho-ERA	354.69
	Total	3,092.18
All Agencies	Total	\$80,275.89

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941
COEUR D'ALENE OPERATION

Item	Forest Service	Bureau of Entomology and Plant Quarantine			Total
	Regular	Regular	ERA	Total	
Salaries, perm. men	\$ 1,430.00	\$2,737.49		\$2,737.49	\$ 4,167.49
Salaries, temp. men	13,513.99		\$ 25.55	25.55	13,539.54
Wages, temp. laborers	49,427.26		92.29	92.29	49,519.55
Subsistence supplies	9,863.77				9,863.77
Equipment	411.41				411.41
Travel and transp.	783.89		204.05	204.05	987.94
Other supplies	1,753.39		32.80	32.80	1,786.19
Total	\$77,183.71	\$2,737.49	\$354.69	\$3,092.18	\$80,275.89

TABLE 2A

DISTRIBUTION OF BLISTER RUST CONTROL EXPENDITURES
BY PROGRAMS
COEUR D'ALENE OPERATION

Program	Number of Effective Man-Days	Expenditures According to Fund		Effective Man-Day Cost
Planning, Coordination and Technical Direction		EQ-Reg.	\$ 2,737.49	
FS-Reg.	8,386	FS-Reg.	74,040.85	\$ 8.83
CCC	1,289	FS-Reg.	200.00	CCC Funds Not Included
Pine Disease Survey and Post Check	231	FS-Reg.	2,942.86	14.28
		EQ-ERA	354.69	
		Total	3,297.55	
Total Cost of 1941 Program			\$80,275.89	

Forest Service

	Regular
Number of meals served	47,504
Average cost per meal	\$0.203
Pounds of twine used	1,600

**SUMMARY OF RIBES ERADICATION, 1941
COEUR D'ALENE OPERATION**

TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Ribes Remaining Per Acre	
							Bushes	Live Stem
Open Reproduction	2,881	3,420	241	6,542	7,739	1,132,907	5.7	12.2
Open Pole	66			66	10	2,002		
Open Mature		47		47	27	5,382		
Cutover	208	297		505	898	178,443	4.4	6.9
Burn		348		348	751	233,398	25.6	29.8
All Upland	3,155	4,112	241	7,508	9,425	1,552,132	6.0	12.2
Stream (Hand)	80	179		259	475	97,893	9.2	14.4
All Types	3,235	4,291	241	7,767	9,900	1,650,025	6.5	12.5

TABLE 3A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man-Days	Ribes	Bushes	Live Stem
Open Reproduction	2,881	4,302	899,503	1.49	312	7.7	17.8
Open Pole	66	10	2,002	.15	30		
Cutover	208	569	108,776	2.74	523	5.0	7.8
All Upland	3,155	4,881	1,010,281	1.55	320	7.5	17.2
Stream (Hand)	80	144	33,988	1.80	425	17.6	26.9
All Types	3,235	5,025	1,044,269	1.55	323	8.7	18.3

TABLE 3B - SECOND WORKING

Open Reproduction	3,420	3,132	220,605	.92	65	3.8	7.2
Open Mature	47	27	5,382	.57	115		
Cutover	297	329	69,667	1.11	235	3.7	5.9
Burn	348	751	233,398	2.16	671	25.6	29.8
All Upland	4,112	4,239	529,052	1.03	129	4.7	8.0
Stream (Hand)	179	331	63,905	1.85	357	5.1	8.5
All Types	4,291	4,570	592,957	1.07	138	4.8	8.1

TABLE 3C - THIRD WORKING

Open Reproduction	241	305	12,799	1.27	53	4.8	5.4
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TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941
COEUR D'ALENE OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
					Man-Days	Ribes	Bushes	Live Stem
First	FS-Reg.	3,133	4,603	1,027,462	1.47	328	7.7	17.8
	F-CCC	102	422	16,807	4.14	165		
	Total	3,235	5,025	1,044,269	1.55	323	7.7	17.8
Second	FS-Reg.	3,899	3,703	557,945	.95	143	4.8	7.8
	F-CCC	392	867	35,012	2.21	89	4.7	10.3
	Total	4,291	4,570	592,957	1.07	138	4.8	8.1
Third	FS-Reg.	241	305	12,799	1.27	53	4.8	5.4
All Workings	FS-Reg.	7,273	8,611	1,598,206	1.18	220	6.6	12.6
	F-CCC	494	1,289	51,819	2.61	105	4.7	10.3
	Total	7,767	9,900	1,650,025	1.27	212	6.5	12.5

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941
COEUR D'ALENE OPERATION

State	Working	Number of Acres Worked By Forest Service		Total
		Forest Service	Private	
Idaho	First	3,087	148	3,235
	Second	4,053	238	4,291
	Third	173	68	241
	Total	7,313	454	7,767

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
COEUR D'ALENE OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inermis	
First	Open Reproduction	2,881	725,223	173,947	333	899,503
	Open Pole	66	105	1,897		2,002
	Cutover	208	108,642	134		108,776
	All Upland	3,155	833,970	175,978	333	1,010,281
	Stream	80	11,823		22,165	33,988
	All Types	3,235	845,793	175,978	22,498	1,044,269
Second	Open Reproduction	3,420	127,392	93,213		220,605
	Open Mature	47	5,376	6		5,382
	Cutover	297	65,022	4,645		69,667
	Burn	348	175,977	57,421		233,398
	All Upland	4,112	373,767	155,285		529,052
	Stream	179	60,483	609	2,813	63,905
Third	All Types	4,291	434,250	155,894	2,813	592,957
	Open Reproduction	241	10,153	2,646		12,799
All Workings	Open Reproduction	6,542	862,768	269,806	333	1,132,907
	Open Pole	66	105	1,897		2,002
	Open Mature	47	5,376	6		5,382
	Cutover	505	173,664	4,779		178,443
	Burn	348	175,977	57,421		233,398
	All Upland	7,508	1,217,890	333,909	333	1,552,132
	Stream	259	72,306	609	24,978	97,893
	All Types	7,767	1,290,196	334,518	25,311	1,650,025

SUMMARY OF RIBES ERADICATION, 1927-1941
COEUR D'ALENE OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes
Open Reproduction	70,930	13,698	1,860	86,488	147,542	20,507,587
Dense Reproduction	11,832	1,365	19	13,216	12,323	1,206,154
Open Pole	49,593	4,853	658	55,104	31,206	4,546,980
Dense Pole	16,439	929	167	17,535	4,884	696,469
Open Mature	128,834	10,242	1,826	140,902	95,747	15,196,004
Dense Mature	13,023	651		13,674	2,100	261,153
Cutover	11,873	7,329	3,961	23,163	33,524	6,816,716
Brush	10,555	507		11,062	15,717	2,332,028
Burn	5,619	399		6,018	4,489	1,134,268
Subalpine	485			485	283	76,762
Meadow-Field	157			157		
All Upland	319,340	39,973	8,491	367,804	347,815	52,774,121
Stream (Hand)	13,204	4,429	1,181	18,814	59,270	12,313,781
Stream (Slash)	78	13		91	1,792	68,731
Stream (Machine)	1,045	87		1,132	5,038	566,000
Stream (Zone)	208	2,477		2,685	2,139	227,333
All Stream	14,535	7,006	1,181	22,722	68,239	13,175,845
All Types	333,875	46,979	9,672	390,526	416,054	65,949,966

TABLE 7A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Per Acre Basis Man-Days	Ribes
Open Reproduction	70,930	121,639	18,599,395	1.71	262
Dense Reproduction	11,832	10,586	1,075,972	.89	91
Open Pole	49,593	27,221	3,902,221	.55	79
Dense Pole	16,439	4,366	617,178	.27	38
Open Mature	128,834	86,481	13,988,483	.67	109
Dense Mature	13,023	1,761	222,188	.14	17
Cutover	11,873	16,580	4,445,173	1.40	374
Brush	10,555	14,983	2,234,161	1.42	212
Burn	5,619	3,509	753,959	.62	134
Subalpine	485	283	76,762	.58	158
Meadow-Field	157				
All Upland	319,340	287,409	45,915,492	1.90	144
Stream (Hand)	13,204	48,747	10,965,233	3.69	830
Stream (Slash)	78	1,340	64,934	17.18	832
Stream (Machine)	1,045	4,616	522,500	4.42	500
Stream (Zone)	208	270	55,658	1.30	268
All Stream	14,535	54,973	11,608,525	3.78	799
All Types	333,875	342,382	57,523,817	1.03	172

TABLE 7B - SECOND WORKING

Open Reproduction	13,698	22,610	1,709,917	1.65	125
Dense Reproduction	1,365	1,713	129,662	1.25	95
Open Pole	4,853	3,335	537,207	.69	111
Dense Pole	929	424	73,713	.46	79
Open Mature	10,242	8,317	1,097,631	.81	107
Dense Mature	651	339	38,965	.52	60
Cutover	7,329	11,048	1,821,123	1.51	248
Brush	507	734	97,867	1.45	193
Burn	399	980	380,309	2.46	953
All Upland	39,973	49,500	5,886,394	1.24	147
Stream (Hand)	4,429	9,154	1,253,205	2.07	283
Stream (Slash)	13	452	3,794	34.77	292
Stream (Machine)	87	422	43,500	4.85	500
Stream (Zone)	2,477	1,869	171,675	.70	69
All Stream	7,006	11,897	1,472,174	1.70	210
All Types	46,979	61,397	7,358,568	1.31	157

TABLE 7C - THIRD WORKING

Open Reproduction	1,860	3,293	198,275	1.77	107
Dense Reproduction	19	24	520	1.26	27
Open Pole	658	650	107,552	.99	163
Dense Pole	167	94	5,578	.56	33
Open Mature	1,826	949	109,890	.52	60
Cutover	3,961	5,896	550,420	1.49	139
All Upland	8,491	10,906	972,235	1.28	115
Stream (Hand)	1,181	1,369	95,346	1.16	81
All Stream	9,672	12,275	1,067,581	1.27	110

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1927-1941
COEUR D'ALENE OPERATION

Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis Man-Days	Ribes
First	EQ-Reg.	25,776	8,351	2,846,383	.32	110
	FS-Reg.	39,271	41,592	8,371,437	1.06	213
	FS-NIRA	86,083	59,504	13,399,102	.69	156
	EQ-ERA	40,997	35,497	6,584,066	.87	161
	FS-ERA	16,005	19,408	3,063,881	1.21	191
	F-CCC	125,743	178,030	23,258,948	1.42	185
	Total	333,875	342,382	57,523,817	1.03	172
Second	FS-Reg.	19,354	19,150	3,749,307	.99	194
	FS-NIRA	5,300	2,869	498,629	.54	94
	EQ-ERA	42	44	5,151	1.05	123
	FS-ERA	3,836	4,866	634,163	1.27	165
	F-CCC	18,447	34,468	2,471,318	1.87	134
	Total	46,979	61,397	7,358,568	1.31	157
Third	FS-Reg.	5,104	4,521	627,990	.89	123
	FS-ERA	487	250	24,398	.51	50
	F-CCC	4,081	7,504	415,193	1.84	102
	Total	9,672	12,275	1,067,581	1.27	110
All Workings	EQ-Reg.	25,776	8,351	2,846,383	.32	110
	FS-Reg.	63,729	65,263	12,748,734	1.02	200
	FS-NIRA	91,383	62,373	13,897,731	.68	152
	EQ-ERA	41,039	35,541	6,589,217	.87	161
	FS-ERA	20,328	24,524	3,722,442	1.21	183
	F-CCC	148,271	220,002	26,145,459	1.48	176
	Total	390,526	416,054	65,949,966	1.07	169

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1927-1941
COEUR D'ALENE OPERATION

Working	Number of Acres Worked by Ownership Classes			Total
	Forest Service	State - Idaho	Private	
First	313,066	5,659	15,150	333,875
Second	43,506	530	2,943	46,979
Third	8,579	200	893	9,672
All Workings	365,151	6,389	18,986	390,526

TABLE 10

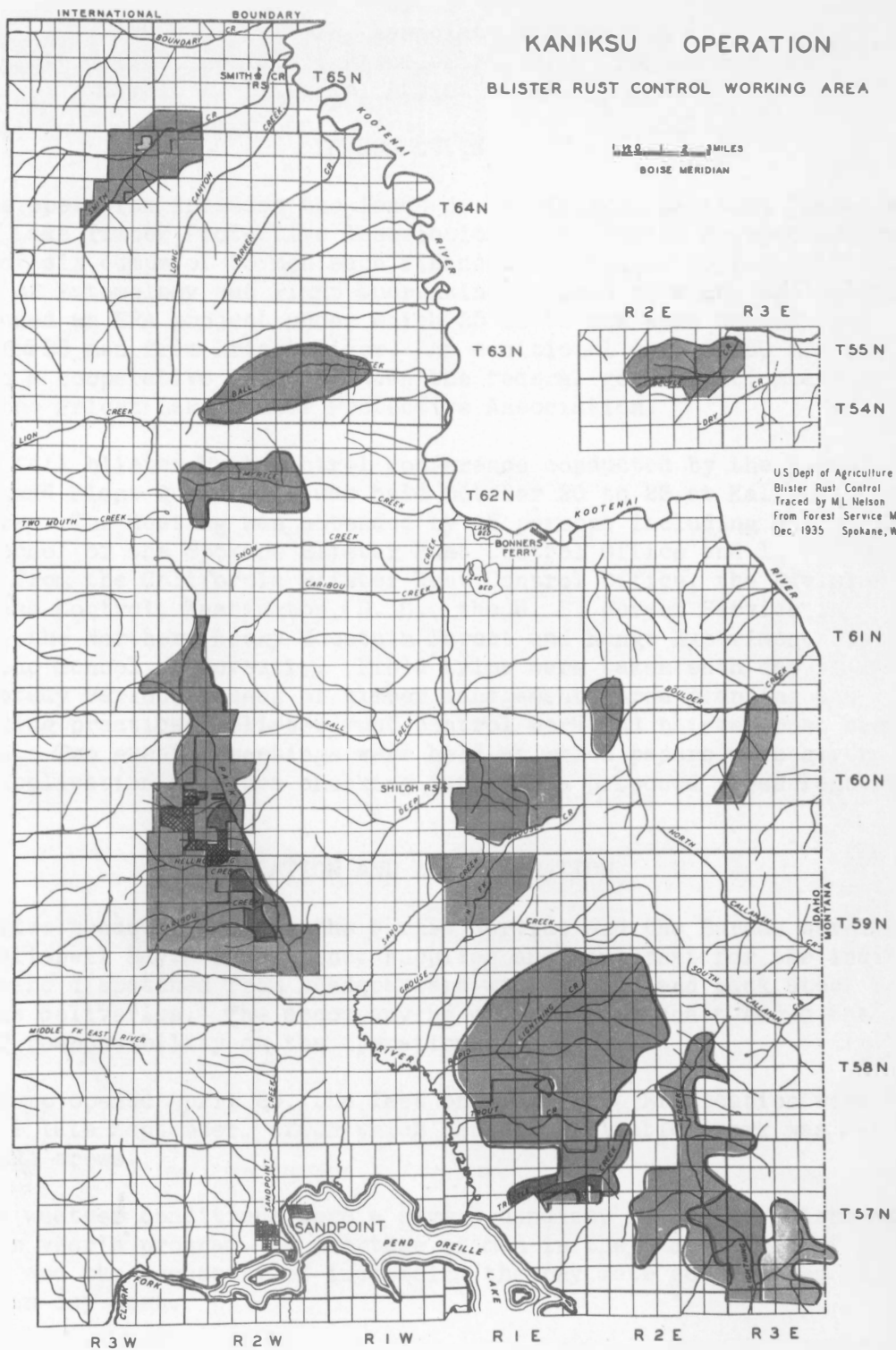
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1927-1941
COEUR D'ALENE OPERATION

Ownership Class	Number of Acres			Acres Mature Stands on Which Working Is Deferred	Total Acres White Pine
	Worked	Unworked	Total		
Forest Service	313,066	34,636	347,702	10,303	358,005
Public Domain		2,110	2,110		2,110
Subtotal Federal	313,066	36,746	349,812	10,303	360,115
State - Idaho	5,659	1,171	6,830		6,830
Private	15,150	8,349	23,499	5,151	28,650
Total	333,875	46,266	380,141	15,454	395,595

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1927-1941
COEUR D'ALENE OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	
First	Open Reproduction	70,930	11,045,512	6,953,597	2,227	499,256	98,803	18,599,395
	Dense Reproduction	11,832	665,227	402,844		5,323	2,578	1,075,972
	Open Pole	49,593	2,194,181	1,644,660	12,246	9,082	42,052	3,902,221
	Dense Pole	16,439	456,946	155,203		3,741	1,288	617,178
	Open Mature	128,834	10,859,965	2,899,230	1	79,624	149,663	13,988,483
	Dense Mature	13,023	193,735	17,816		9,778	859	222,188
	Cutover	11,873	3,048,678	1,351,373	1	17,536	27,585	4,445,173
	Brush	10,555	778,322	1,424,834		25,748	5,257	2,234,161
	Burn	5,619	344,681	390,324		13,530	5,424	753,959
	Subalpine	485	55,561	21,201				76,762
	Meadow-Field	157						
	All Upland	319,340	29,642,808	15,261,082	14,475	663,618	333,509	45,915,492
	Stream	14,535	7,107,297	182,129	31,474	4,219,038	68,387	11,608,325
	All Types	333,875	36,750,105	15,443,211	45,949	4,882,656	401,896	57,523,817
Second	Open Reproduction	13,698	880,720	807,638		12,807	8,752	1,709,917
	Dense Reproduction	1,365	102,536	27,032		11	83	129,662
	Open Pole	4,853	424,818	103,206	4,736	3,882	565	537,207
	Dense Pole	929	52,890	20,823				73,713
	Open Mature	10,242	781,912	300,518		11,089	4,112	1,097,631
	Dense Mature	651	37,723	1,017			225	38,965
	Cutover	7,329	1,401,680	402,933		13,430	3,080	1,821,123
	Brush	507	11,517	86,350				97,867
	Burn	399	262,454	117,855				380,309
	All Upland	39,973	3,956,250	1,867,372	4,736	41,219	16,817	5,886,394
	Stream	7,006	1,026,507	43,277		396,389	6,001	1,472,174
	All Types	46,979	4,982,757	1,910,649	4,736	437,608	22,818	7,358,568
Third	Open Reproduction	1,860	128,980	68,228		1,067		198,275
	Dense Reproduction	19	520					520
	Open Pole	658	96,829	10,723				107,552
	Dense Pole	167	5,578					5,578
	Open Mature	1,826	95,320	14,570				109,890
	Cutover	3,961	471,005	79,415				550,420
	All Upland	8,491	798,232	172,936		1,067		972,235
	Stream	1,181	67,556	113		27,677		95,346
	All Types	9,672	865,788	173,049		28,744		1,067,581
All Workings	Open Reproduction	86,488	12,055,212	7,829,463	2,227	513,130	107,555	20,507,587
	Dense Reproduction	13,216	768,283	429,876		5,334	2,661	1,206,154
	Open Pole	55,104	2,715,828	1,758,589	16,982	12,964	42,617	4,546,980
	Dense Pole	17,535	515,414	176,026		3,741	1,288	696,469
	Open Mature	140,902	11,737,197	3,214,318	1	90,713	153,775	15,196,004
	Dense Mature	13,674	231,458	18,833		9,778	1,084	261,153
	Cutover	23,163	4,921,363	1,833,721	1	30,966	30,665	6,816,716
	Brush	11,062	789,839	1,511,184		25,748	5,257	2,332,028
	Burn	6,018	607,135	508,179		13,530	5,424	1,134,268
	Subalpine	485	55,561	21,201				76,762
	Meadow-Field	157						
	All Upland	367,804	34,397,290	17,301,390	19,211	705,904	350,326	52,774,121
	Stream	22,722	8,201,360	225,519	31,474	4,643,104	74,388	13,175,845
	All Types	390,526	42,598,650	17,526,909	50,685	5,349,008	424,714	65,949,966



BLISTER RUST CONTROL WORK, KANIKSU OPERATION, 1941

By

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INTRODUCTION

The Kaniksu operation includes the lands of the Kaniksu National Forest and the Priest Lake Timber Protective Association. The Forest Service program consisted of six camps of 33 men each financed by regular appropriations. The Bureau of Entomology and Plant Quarantine program on state and private lands included an ERA project under which 25 to 75 men were hauled from Sandpoint and 25 men from Priest River. An additional camp of 60 men was financed on a cooperative basis between the federal government, state of Idaho and the Priest Lake Timber Protective Association.

The annual fall blister rust control conference conducted by the Bureau of Entomology and Plant Quarantine was held October 20 to 23 at Kalispell Bay headquarters. The meeting was attended by 45 persons including all of the field personnel of the Spokane Blister Rust Control Office and 11 representatives from the California Blister Rust Control Office, the Division of Plant Disease Control, Washington, D. C., the U. S. Forest Service in Region One, the Northern Rocky Mountain Forest and Range Experiment Station and the Idaho School of Forestry. Field trips were taken each day to inspect and study various phases of timber management, tree planting and direct seeding practices, blister rust control work and blister rust canker elimination. Two evening meetings were held at which papers were given on the field application of ribes checking data and a proposed ribes regeneration key.

ORGANIZATION AND ADMINISTRATION

Administrative headquarters for the Forest Service and the Bureau were located at Kalispell Bay. Subsistence supplies and equipment for the individual camps were dispatched from headquarters with trucks and pack stock being used to make deliveries. The accompanying organization chart shows the division of responsibility on the operation.

The first camp opened April 20, the last one June 24. Eradication work continued until late September, after which canker elimination work was carried on by the ERA crews.

Unfavorable weather conditions were a severe handicap to the efficient operation of this year's program. A shortage of men in the camps, loss of time due to rain and the necessity of increasing the pay rate contributed to an increased man-day cost.

LOCATION AND DESCRIPTION OF AREAS

The regular Forest Service camps were located in the South Fork of Granite Creek, Tillicum Creek, Upper Priest River, Bench Creek, Tunnel Creek, Jeru Creek and Kalispell Creek. The Bureau camps were operated in Big Creek, Fox Creek, the Baldy area and Pack River. The cooperative camp was located in Big Creek.

The South Fork of Granite, Jeru and Bench Creeks, and parts of Big Creek, presented difficult eradication problems. Other areas represented medium to light working conditions.

Recently 10,780 acres have been returned to the National Forest by the Northern Pacific. This gives the Forest Service solid ownership in the South Fork of Granite Creek area where considerable eradication work has been carried on.

METHODS AND EQUIPMENT

In general, standard methods and equipment were used. One-man crews were given a thorough tryout on what was considered a suitable area but the practice was soon abandoned due to the lowered efficiency of this method. Two-man crews were used successfully, but not extensively. Flanking crews covered a considerable acreage in the Kalispell Creek drainage.

CHECKING AND PINE DISEASE SURVEY

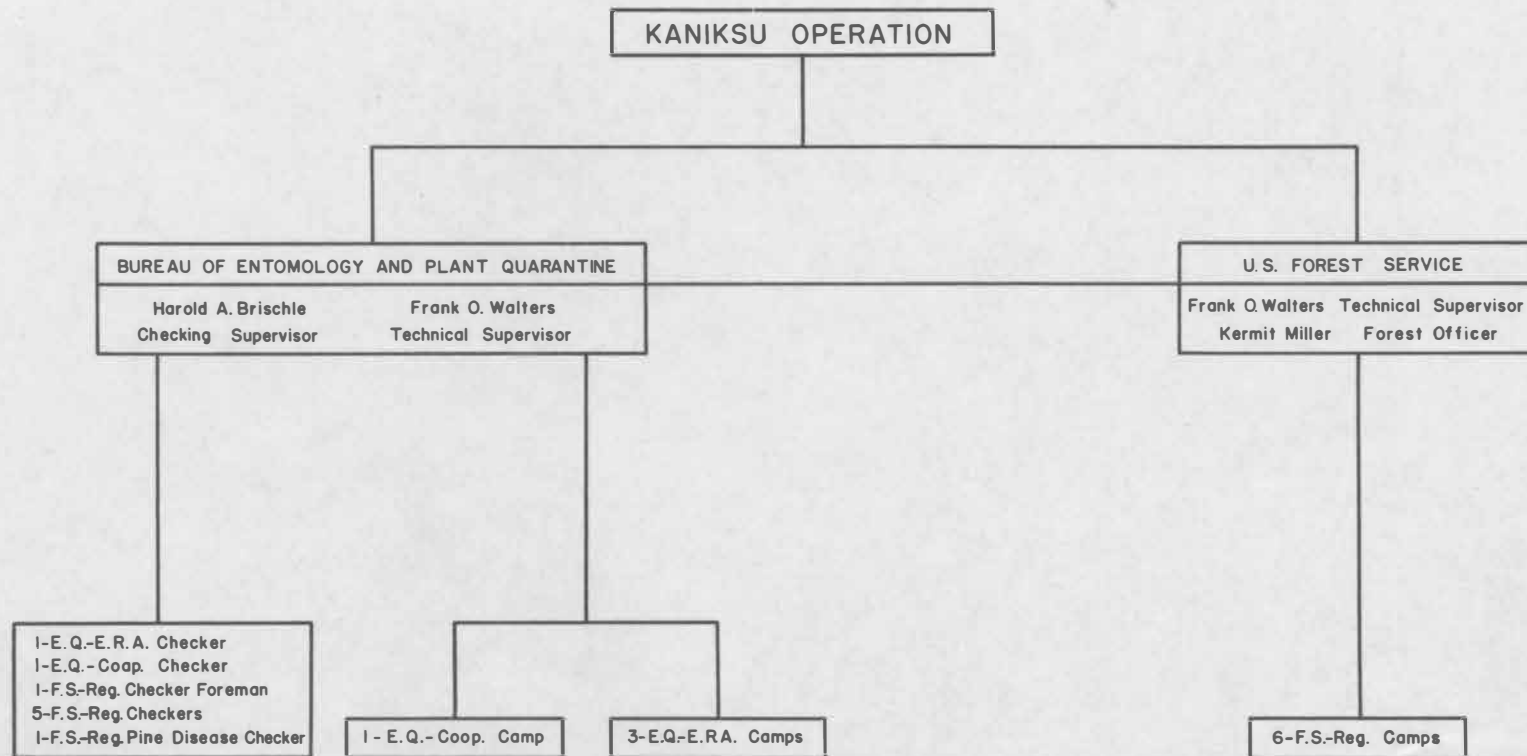
The regular checking activity on the Kaniksu operation during 1941 included pine disease survey work which in the past was handled as a separate project.

The checking of current season work still constitutes the major portion of the checking work on the operation. Since comparatively little initial eradication was done, only a limited amount of advance survey was conducted. Regular checking included one or more four per cent samples on practically all lands worked during the year. A total of 19,353 acres of first, second, third and fourth workings was checked at a cost of \$0.179 per acre.

One of the most important functions of checking is that which measures the effectiveness of ribes suppression several years after eradication work. Due to ecological conditions certain areas are especially favorable to the future germination of ribes seed. On such areas a post check is made several years after eradication to determine the extent and amount of ribes regeneration. By augmenting this post check with a pine disease survey, correlative data showing the effectiveness of ribes suppression and the spread of the rust are obtained. From future surveys it will be possible to calculate the rate of increase or decrease of infection for individual areas.

Post check and pine disease survey were made on areas totaling 8,835 acres at a cost of \$0.099 per acre. This survey was carried on in 12 separate drainages or areas where 82.2 miles of check strip were run. The summaries of these results by individual area are shown in the succeeding section.

ORGANIZATION CHART



E.Q.-COOP.
Number of Camps - 1
Number of Men - 50

E.Q.-E.R.A.
Number of Camps - 3
Number of Men - 60

F.S.-REG.
Number of Camps - 6
Number of Men - 176

Total Number of Men on Blister Rust Work - 286



White pine in Two Mouth Creek drainage, which is part of the extensive Idaho state-owned forest along the east side of Priest Lake. Much of the state land has been given protection from blister rust.

1. Cuban Hill Plantation, T. 57 N., R. 5 W., secs. 26, 35

Acres in area	360
Miles of survey strip	1.3
Number trees examined	1,582
Number trees infected	102
Per cent trees infected	6.4
Number cankers found	144

This planting was made in 1932 on an area burned over in 1931. Initial ribes eradication work was done early in the fall of 1938. The pine infection on most of the area is less than one per cent, but a heavy center on 30 acres increases the average for the entire area. The infection is largely of 1937 origin with a small amount of 1938 which apparently occurred before the ribes were removed in the fall of 1938.

The portions of the area having ribes concentrations were worked in 1941, and the final check shows one ribes and one foot of live stem per acre remaining on the area. In the fall of 1941 trees having trunk cankers were cut, and limb cankers were removed by pruning.

2. Lower West Branch, T. 57 N., R. 5 W., secs. 7, 8

Acres in area	500
Miles of survey strip	7.2
Number trees examined	3,361
Number trees infected	10
Per cent trees infected	0.3
Number cankers found	11

This area was cut over approximately 15 years ago. Some of the reproduction is approaching pole size. Initial ribes eradication work was done in 1934. The post check in 1936 indicated that the ribes population on most of the upland area was sufficiently low to place it in the maintenance classification. The 1941 pine disease survey verified this fact since the only ribes found were confined to the immediate vicinity of streams and seepages, where also a small amount of 1937 pine infection was found.

3. Gleason Meadows, T. 58 N., R. 5 W., secs. 3, 10

Acres in area	50
Miles of survey strip	.8
Number trees examined	804
Number trees infected	15
Per cent trees infected	2.0
Number cankers found	15

Areas in the vicinity of Gleason Meadows were given initial ribes eradication in 1934. No ribes were found on any of the survey strips in the upland and only an occasional bush was observed in the stream type. The infection found is all of 1937-1938 origin and was apparently introduced by the ribes in the stream type and along the edge of the meadows.

4. Upper West Branch, T. 59 N., R. 5 W., secs. 14, 15, 16, 17, 20, 21, 22, 23

Acres in area	1,400
Miles of survey strip	18.1
Number trees examined	11,315
Number trees infected	137
Per cent trees infected	1.2
Number cankers found	145

The pine disease survey in the Upper West Branch drainage was confined to areas cut over from 1928 to 1935 on which reproduction has become well established. Initial eradication work was done in 1934. The survey showed seven ribes and 50 feet of live stem per acre on the area. These ribes were found largely near streams and wet places with very few in the upland.

A high per cent of the cankers found were parasitized and have never fruited. The infection found is of 1937 and 1938 origin. There is still some regeneration of ribes on the more recently cutover areas, while on the older cutover areas germination has ceased.

5. Big Creek Drainage, T. 57 N., R. 3 W., secs. 5, 6

Acres in area	115
Miles of survey strip	1.3
Number trees examined	1,690
Number trees infected	833
Per cent trees infected	49.5
Number cankers found, (partial tally)	2,786

A large-scale logging operation was carried on in the Big Creek drainage from 1928 to 1934. Since 1934, numerous small white pine and cedar sales have been made, causing continued ground disturbance favorable to the germination of ribes seed.

Initial ribes eradication work was done prior to logging in 1928, and second and third eradication work was done in 1937, 1938 and 1941 over parts of the area. The reproduction of white pine has been heavy over most of the area, and the pine disease survey data indicate that the somewhat heavy infection took place in 1937 and 1938.

After the pine disease survey was completed, eradication crews covered sections 5 and 6. There are still numerous ribes seedlings which will necessitate additional eradication work.

From the above pine disease survey data it will be noted that the per cent of infected trees is quite high. A canker elimination project by limb removal was conducted on this area to save a good stocking of white pine.

6. Fox Creek Drainage, T. 57 N., R. 4 W., sec. 2; T. 58 N., R. 4 W., sec. 36

Acres in area	640
Miles of survey strip	3.6
Number trees examined	3,389
Number trees infected	126
Per cent trees infected	3.7
Number cankers found	397

Initial ribes eradication was done in the Fox Creek drainage in 1928 shortly before the area was cut over. Sufficient seed trees were left standing to insure the reproduction of white pine. The area was given a second eradication in 1937, and a third in 1939. During the 1941 field season portions of the area where the ribes population persisted were again worked. Prior to the 1941 eradication work a pine disease survey and post check were made on the area. At the present time there seems to be no new germination of ribes on the area; however, there are still some small bushes along the numerous old skid roads and log chutes as shown by the 1941 final check.

Infection on this area is generally distributed and occurred in 1937, 1938 and 1939.

7. Kalispell Bay, T. 60 N., R. 5 W., secs. 9, 12

Acres in area	240
Miles of survey strip	4.1
Number trees examined	5,222
Number trees infected	8
Per cent trees infected	0.3
Number cankers found	8

Areas in the vicinity of Kalispell Bay were burned over by a 1926 fire, the results of which caused numerous snags and down timber. This burn was so extensive that natural reseeding of white pine was questionable. Since the fire hazard was fairly high, the Forest Service deemed it advisable to fell all dead timber, control-burn and plant the area. This procedure was carried out, and portions of the area around Kalispell Bay were control-burned in the fall of 1935 and 1936 and planted the year following the respective burning. The control burning resulted in fires hot enough to destroy any ribes seed that may have been stored in the ground, and subsequent regeneration from seed has been confined almost entirely to the edges of several small streams. Initial ribes eradication work was done in 1934 before plans had been made for the snagging and control-burning program.

The pine disease survey indicates a very small amount of pine infection is present along with ribes to the extent of one bush and one foot of live stem per acre as determined by the survey. The pine infection found is all of 1937 and 1938 origin.

8. Tillicum Creek Drainage, T. 37 N., R. 45 E., sec. 3

Acres in area	160
Miles of survey strip	1.8
Number trees examined	3,165
Number trees infected	52
Per cent trees infected	1.6
Number cankers found	58

Most of the Tillicum Creek drainage was included in the 1926 burn. White pine reproduction and the reproduction of ribes on the area have been heavy. Much dead and down timber and brush have made it a difficult area to work. Eradication crews covered portions of Tillicum Creek in 1934, 1939, 1940 and 1941. The 1941 pine disease survey was made on areas given initial eradication in 1934. After the 1941 disease survey was completed, the area was given a second working by eradication crews. A final check on the 1941 eradication work shows three ribes and seven feet of live stem per acre remaining on the upland area. The disease survey indicates that pine infection is generally distributed over the entire area and shows it to be largely of 1937 and 1938 origin.

9. Packer Creek, T. 62 N., R. 5 W., secs. 15, 16, 21, 22

Acres in area	800
Miles of survey strip	3.3
Number trees examined	2,567
Number trees infected	43
Per cent trees infected	1.6
Number cankers found	51

The areas on which the pine disease survey was made in Packer Creek were given initial eradication in 1936 and 1938. Infection found on the areas is light and of 1936, 1937 and 1938 origin. The survey showed three ribes and 20 feet of live stem per acre on the area.

10. Granite Mountain, T. 62 N., R. 5 W., secs. 25, 36; T. 61 N., R. 5 W., sec. 1

Acres in area	520
Miles of survey strip	4.8
Number trees examined	4,497
Number trees infected	320
Per cent trees infected	7.1
Number cankers found	369

The area surveyed in the vicinity of Granite Mountain was burned over in 1926. Since the fire there has been a heavy regeneration of white pine and ribes. Ribes eradication on the area has been difficult due to the large amount of down timber and brush. Initial eradication was performed on a part of the area in 1934. Additional first work and some second work were done in 1936 and 1939. Few ribes were found on the survey, indicating that a good job of second eradication was made in 1939. Initial pine infection

probably occurred on the area as early as 1933 with a heavy spread in 1936, 1937 and 1938.

11. South Fork of Granite Creek, T. 37 N., R. 45 E., secs. 19, 20, 21, 30.

	<u>Year of Eradication - 1934-1940</u>	<u>Unworked</u>
Acres in area	1,300	160
Miles of survey strip	15.0	1.9
Number trees examined	13,474	11,672
Number trees infected	1,226	1,269
Per cent trees infected	9.1	10.9
Number cankers found	2,422	1,658

The control area in the South Fork of Granite Creek drainage comprises approximately 18 sections, almost all of which were in the 1926 fire. Initial ribes eradication was started in 1934, and both initial and second work were made in 1939, 1940 and 1941. All initial eradication within the control boundary was completed in 1941. The results of an effective job of ribes eradication in 1934 are in evidence since most of the rust found is in areas that were not worked until after the heavy 1937 wave of infection took place.

The survey shows that approximately 14 ribes per acre remain on the worked area. The live stem per acre is low since all ribes found are one foot or less in size.

12. Sema and Diamond Creek Drainages, T. 36 N., R. 46 E., sec. 6; T. 36 N., R. 45 E., secs. 1, 2, 3; T. 37 N., R. 45 E., secs. 35, 36.

	<u>Year of Eradication - 1934</u>	<u>1936</u>	<u>Unworked</u>
Acres in area	420	60	2,050
Miles of survey strip	2.8	0.8	15.4
Number trees examined	3,331	362	7,958
Number trees infected	137	0	293
Per cent trees infected	4.1	0	3.7
Number cankers found	215	0	345

These drainages are within the 1926 burn area. Initial eradication was done in 1934 and 1936. Due to the very heavy ribes population, high fire hazard and severity of the rust, a portion of the Diamond Creek drainage has been snagged by the Forest Service and will be control-burned and planted. Most of the Diamond Creek area, however, was so severely burned in 1926, that few white pine or ribes have come back. This is the reason most of the drainage remains unworked.

CANKER ELIMINATION

In certain well-stocked, rather heavily infected areas of white pine it was found to be reasonably practical to prevent heavy loss of the young pine by eliminating the cankers which had not yet reached the trunk of the tree.

In general, the lower third of the limbs was pruned off without inspecting for cankers. The remaining limbs were then inspected for infection before further cutting was performed. Additional inspections are made by more highly skilled individuals to improve the efficiency of the work. Although it is impossible to eliminate all infected limbs a very high per cent of the infected trees which otherwise would have been lost are saved by this treatment. During the period from late September to December 30, 2,104 acres were covered and 820,552 trees were treated with an expenditure of 1,959 man-days.

The bulk of this work was carried on in Big Creek. Other areas treated were Cuban Hill Plantation, Tunnel Creek and Lamb Creek.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables by the cooperating agency and the type of appropriation:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941 KANIKSU OPERATION

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	\$ 66,375.31
	Regular	6,742.87
Bureau of Entomology and Plant Quarantine	Regular-Coop.	2,082.52
	Idaho-ERA	48,623.05
	Wash.-ERA	816.69
	Total	58,265.13
Idaho PLTPA	State	2,038.46
	Private	4,282.62
	Total	6,321.08
All Agencies	Total	\$130,962.02

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941
KANIKSU OPERATION

Item	Forest Service	Bureau of Entomology and Plant Quarantine			Contrib. Funds	Total
	Regular	Regular	ERA	Total	Idaho and CTPA	
Sal. perm. men	\$ 1,283.29	\$4,900.00		\$ 4,900.00		\$ 6,183.29
Sal. temp. men	8,926.02		\$ 5,841.42	5,841.42		14,767.44
Wages, temp. labs.	39,789.78	497.00	37,331.12	37,828.12	\$6,321.08	83,938.98
Subs. supplies	10,670.29	2,225.32	2,711.01	4,936.33		15,606.62
Equipment	2,157.59	173.11	100.69	273.80		2,431.39
Trucks	891.67					891.67
Travel & transp.	410.65	474.35	1,824.29	2,298.64		2,709.29
Twine	1,629.18					1,629.18
Other supplies	617.34	555.61	1,631.21	2,186.82		2,804.16
Total	\$66,375.81	\$8,825.39	\$49,439.74	\$58,265.13	\$6,321.08	\$130,962.02

TABLE 2A

DISTRIBUTION OF BLISTER RUST CONTROL EXPENDITURES BY PROGRAMS
KANIKSU OPERATION

Program	Number of Effective Man-Days	Expenditures According to Fund		Effective Man-Day Cost
Planning, Coordination, and Technical Direction		EQ-Reg.	\$ 3,675.00	
FS-Reg.	6,996	FS-Reg.	65,121.15	\$9.32
Cooperative	1,628	Idaho	2,038.46	6.44
		PLTPA	4,282.62	
		EQ-Reg.	2,067.87	
		EQ-Reg.-Coop.	2,082.52	
		Total	10,471.47	
EQ-ERA	5,310	EQ-ERA	39,970.80	7.71
		EQ-Reg.	1,000.00	
		Total	40,970.80	
Pine Disease Survey	111	FS-Reg.	974.66	8.78
Canker Elimination	1,959	FS-Reg.	280.00	4.46
		EQ-ERA	9,468.94	
		Total	9,748.94	
Total Cost of 1941 Program			\$130,962.02	

Number of meals served
Average cost per meal
Pounds of twine used

Forest Service	Bureau
39,012	26,520
\$0.2189	\$0.2132
3,300	1,150

SUMMARY OF RIBES ERADICATION, 1941
KANIKSU OPERATION

TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Ribes Remaining Per Acre	
							Bushes	Live Stem
Open Reproduction	5,159	6,256	3,869	15,284	11,059	2,110,316	4	4
Dense Reproduction		9	60	69	70	74,793	1	5
Open Pole	875	1,197		2,072	1,161	120,067	3	6
Dense Pole		367	10	377	58	1,840	1	2
Open Mature	567	368	76	1,011	318	35,856	2	3
Cutover	596	356	51	1,003	723	157,212	5	3
Brush			32	32	24	500	1	1
All Upland	7,197	8,553	4,098	19,848	13,413	2,500,584	4	4
Stream (Hand)	87	171	92	350	521	68,765	2	4
All Types	7,284	8,724	4,190	20,198	13,934	2,569,349		

TABLE 3A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man-Days	Ribes	Bushes	Live Stem
Open Reproduction	5,159	3,046	806,215	.59	156	2	3
Open Pole	875	841	95,288	.96	109	2	4
Open Mature	567	141	16,513	.25	29	1	3
Cutover	596	506	95,354	.85	160	3	3
All Upland	7,197	4,534	1,013,370	.63	141	2	3
Stream (Hand)	87	189	25,806	2.17	297	2	4
All Types	7,284	4,723	1,039,176	.65	143		

TABLE 3B - SECOND WORKING

Open Reproduction	6,256	3,689	715,164	.59	114	3	4
Dense Reproduction	9	1		.11		0	0
Open Pole	1,197	320	24,779	.27	21	2	6
Dense Pole	367	52	1,771	.14	5	1	1
Open Mature	368	127	18,409	.35	50	2	4
Cutover	356	172	52,152	.48	146	4	3
All Upland	8,553	4,361	812,275	.51	95	3	4
Stream (Hand)	171	235	36,824	1.37	215	2	3
All Types	8,724	4,596	849,099	.53	97		

TABLE 3C - THIRD WORKING

Open Reproduction	3,869	4,324	588,937	1.12	152	8	4
Dense Reproduction	60	69	74,793	1.15	1,247	0	0
Dense Pole	10	6	69	.60	7	0	0
Open Mature	76	50	934	.66	12	0	0
Cutover	51	45	9,706	.88	190	2	2
Brush	32	24	500	.75	16	0	0
All Upland	4,098	4,518	674,939	1.10	165	2	4
Stream (Hand)	92	97	6,135	1.05	67	1	1
All Types	4,190	4,615	681,074	1.10	163		

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941
KANIKSU OPERATION

State	Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis		Ribes Remaining	
						Man-Days	Ribes	Bushes	Live Stem
Idaho	First	EQ-ERA	1,019	1,274	198,446	1.25	195		
		FS-Reg.	2,295	2,264	249,626	.99	109		
		Total	3,314	3,538	448,072	1.07	135		
	Second	EQ-ERA	1,130	1,018	65,656	.90	58		
		FS-Reg.	2,602	891	76,649	.34	29		
		EQ-Coop.	739	376	63,703	.51	86		
		Total	4,471	2,285	206,008	.51	46		
	Third	EQ-ERA	2,294	3,018	244,875	1.32	107		
		FS-Reg.	209	129	17,944	.62	86		
		EQ-Coop.	1,054	1,252	342,990	1.19	325		
		Total	3,557	4,399	605,809	1.24	170		
	All Workings	EQ-ERA	4,443	5,310	508,977	1.20	115		
		FS-Reg.	5,106	3,284	344,219	.64	67		
		EQ-Coop.	1,793	1,628	406,693	.91	227		
		Total	11,342	10,222	1,259,889	.90	111		
Washington	First	FS-Reg.	3,970	1,185	591,104	.30	149		
	Second	FS-Reg.	4,253	2,311	643,091	.54	151		
	Third	FS-Reg.	633	216	75,265	.34	119		
	All Workings	FS-Reg.	8,856	3,712	1,309,460	.42	148		
Idaho and Washington	First	EQ-ERA	1,019	1,274	198,446	1.25	195	4	6
		FS-Reg.	6,265	3,449	840,730	.55	134	2	3
		Total	7,284	4,723	1,039,176	.65	143		
	Second	EQ-ERA	1,130	1,018	65,656	.90	58	3	8
		FS-Reg.	6,855	3,202	719,740	.47	105	3	4
		EQ-Coop.	739	376	63,703	.51	86	6	3
		Total	8,724	4,596	849,099	.53	97		
	Third	EQ-ERA	2,294	3,018	244,875	1.32	107	4	4
		FS-Reg.	842	345	93,209	.41	111	2	4
		EQ-Coop.	1,054	1,252	342,990	1.19	325	20	2
		Total	4,190	4,615	681,074	1.10	163		
	All Workings	EQ-ERA	4,443	5,310	508,977	1.20	115		
		FS-Reg.	13,962	6,996	1,653,679	.50	118		
		EQ-Coop.	1,793	1,628	406,693	.91	227		
		Total	20,198	13,934	2,569,349	.69	127	4	4

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941
KANIKSU OPERATION

State	Working	Number of Acres Worked									Total
		By Forest Service			By Bureau of Entomology and Plant Quarantine			Total			
		Forest Service	State	Private	Forest Service	State	Private	Forest Service	State	Private	
Idaho	First	2,155	60	80	230		789	2,385	60	869	3,314
	Second	2,506		107	589	811	458	3,095	811	565	4,471
	Third	20		191		2,803	543	20	2,803	734	3,557
	Total	4,681	60	378	819	3,614	1,790	5,500	3,674	2,168	11,342
Washington	First	3,970						3,970			3,970
	Second	4,210		43				4,210		43	4,253
	Third	633						633			633
	Total	8,813		43				8,813		43	8,856
Total	First	6,125	60	80	230		789	6,355	60	869	7,284
	Second	6,716		150	589	811	458	7,305	811	608	8,724
	Third	653		191		2,803	543	653	2,803	734	4,190
	Total	13,494	60	421	819	3,614	1,790	14,313	3,674	2,211	20,198

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
KANIKSU OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	
First	Open Reproduction	5,159	250,738	555,477		806,215
	Open Pole	875	67,370	27,918		95,288
	Open Mature	567	9,913	6,600		16,513
	Cutover	596	31,596	63,758		95,354
	All Upland	7,197	359,617	653,753		1,013,370
	Stream	87	21,574	4,232		25,806
	All Types	7,284	381,191	657,985		1,039,176
Second	Open Reproduction	6,256	187,408	523,033	4,723	715,164
	Dense Reproduction	9				
	Open Pole	1,197	12,632	11,697	450	24,779
	Dense Pole	367	691	1,080		1,771
	Open Mature	368	6,949	11,460		18,409
	Cutover	356	15,332	35,078	1,742	52,152
	All Upland	8,553	223,012	582,348	6,915	812,275
	Stream	171	25,051	3,507	8,266	36,824
	All Types	8,724	248,063	585,855	15,181	849,099
Third	Open Reproduction	3,869	159,387	428,635	915	588,937
	Dense Reproduction	60	1,305	73,488		74,793
	Dense Pole	10	23	46		69
	Open Mature	76	563	371		934
	Cutover	51	4,025	680	5,001	9,706
	Brush	32	233	267		500
	All Upland	4,098	165,536	503,487	5,916	674,939
	Stream	92	4,763	1,173	199	6,135
	All Types	4,190	170,299	504,660	6,115	681,074
All Workings	Open Reproduction	15,284	597,533	1,507,145	5,638	2,110,316
	Dense Reproduction	69	1,305	73,488		74,793
	Open Pole	2,072	80,002	39,615	450	120,067
	Dense Pole	377	714	1,126		1,840
	Open Mature	1,011	17,425	18,431		35,856
	Cutover	1,003	50,953	99,516	6,743	157,212
	Brush	32	233	267		500
	All Upland	19,848	748,165	1,739,588	12,831	2,500,584
	Stream	350	51,388	8,912	8,465	68,765
	All Types	20,198	799,553	1,748,500	21,296	2,569,349

SUMMARY OF RIBES ERADICATION 1923-1941
KANIKSU OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes
Open Reproduction	139,520	29,615	5,853	174,988	132,309	34,441,867
Dense Reproduction	22,524	2,336	60	24,920	13,900	1,963,687
Open Pole	98,977	11,903		110,880	41,801	5,779,124
Dense Pole	21,327	2,541	21	23,889	4,762	452,924
Open Mature	110,494	4,515	105	115,114	29,122	5,641,430
Dense Mature	31,047	601		31,648	3,782	433,532
Cutover	8,183	2,408	51	10,642	9,174	2,620,612
Brush	3,599	596	64	4,259	1,510	365,207
Burn	1,132			1,132	1,354	947,874
Subalpine	1,933	50		1,983	1,032	157,110
Meadow-Field	71	10		81	1	72
All Upland	438,807	54,575	6,154	499,536	238,737	52,803,439
Stream (Hand)	20,581	4,981	366	25,928	45,406	9,218,442
Stream (Slash)	576			576	4,994	288,000
Stream (Machine)	1,030			1,030	7,081	614,076
All Stream	22,187	4,981	366	27,534	57,481	10,120,518
All Types	460,994	59,556	6,520	527,070	296,228	62,923,957

TABLE 7A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Per Acre Basis Man-Days	Ribes
Open Reproduction	139,520	99,408	29,223,902	.71	209
Dense Reproduction	22,524	11,655	1,700,022	.52	75
Open Pole	98,977	36,194	5,326,323	.37	54
Dense Pole	21,327	3,924	402,183	.18	19
Open Mature	110,494	26,571	5,355,562	.24	48
Dense Mature	31,047	3,584	415,459	.12	13
Cutover	8,183	4,285	1,166,470	.52	143
Brush	3,599	1,104	336,107	.31	93
Burn	1,132	1,354	947,874	1.20	837
Subalpine	1,933	1,019	156,522	.53	81
Meadow-Field	71				
All Upland	438,807	189,098	45,050,424	.43	103
Stream (Hand)	20,581	36,754	8,254,136	1.79	401
Stream (Slash)	576	4,994	288,000	8.67	500
Stream (Machine)	1,030	7,081	614,076	6.87	596
All Stream	22,187	48,829	9,156,212	2.20	633
All Types	460,994	237,927	54,186,636	.52	118

TABLE 7B - SECOND WORKING

Open Reproduction	29,615	26,165	4,503,107	.88	152
Dense Reproduction	2,336	2,176	188,872	.93	81
Open Pole	11,903	5,607	452,801	.47	38
Dense Pole	2,541	829	50,647	.33	20
Open Mature	4,515	2,476	284,484	.55	63
Dense Mature	601	198	18,073	.33	30
Cutover	2,408	4,844	1,444,436	2.01	600
Brush	596	347	27,842	.58	47
Subalpine	50	13	588	.26	12
Meadow-Field	10	1	72	.10	7
All Upland	54,575	42,656	6,970,922	.78	128
Stream (Hand)	4,981	8,181	935,256	1.64	188
All Types	59,556	50,837	7,906,178	.85	133

TABLE 7C - THIRD WORKING

Open Reproduction	5,853	6,736	714,858	1.15	122
Dense Reproduction	60	69	74,793	1.15	125
Dense Pole	21	9	94	.43	4
Open Mature	105	75	1,384	.71	13
Cutover	51	45	9,706	.88	190
Brush	64	59	1,258	.92	20
All Upland	6,154	6,993	802,093	1.14	130
Stream (Hand)	366	471	29,050	1.29	79
All Types	6,520	7,464	831,143	1.14	127

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1941
KANIKSU OPERATION

State	Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis Man-Days	Ribes
Idaho	First	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	11,145	17,467	2,804,833	1.57	252
		FS-NIRA	72,135	23,866	6,432,376	.33	89
		EQ-ERA	80,596	48,602	8,318,777	.60	103
		FS-ERA	15,853	10,139	1,880,647	.64	119
		EQ-Coop.	111,150	30,929	8,750,877	.28	79
		F-CCC	54,424	36,378	6,379,138	.67	117
		S&P-CCC	112	748	209,356	6.68	1,869
		Total	364,211	174,973	35,842,693	.48	98
	Second	FS-Reg.	7,106	3,346	523,407	.47	74
		FS-NIRA	8,544	2,051	292,658	.24	34
		EQ-ERA	14,337	14,806	2,637,381	1.03	184
		FS-ERA	2,737	2,767	182,793	1.01	67
		EQ-Coop.	4,955	3,628	453,912	.73	92
		F-CCC	4,306	9,510	1,120,286	2.21	260
		S&P-CCC	3,577	3,842	743,055	1.07	208
		Total	45,562	39,950	5,953,492	.88	131
	Third	FS-Reg.	209	129	17,944	.62	86
		EQ-ERA	4,108	5,443	377,339	1.32	92
		EQ-Coop.	1,378	1,324	350,082	.96	254
		Total	5,695	6,896	745,365	1.21	131
	All Workings	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	18,460	20,942	3,346,184	1.13	181
		FS-NIRA	80,679	25,917	6,725,034	.32	83
		EQ-ERA	99,041	68,851	11,333,497	.70	114
		FS-ERA	18,590	12,906	2,063,440	.69	111
		EQ-Coop.	117,483	35,881	9,554,871	.31	81
		F-CCC	58,730	45,888	7,499,424	.78	128
		S&P-CCC	3,689	4,590	952,411	1.24	258
Washington	First	Total	415,468	221,819	42,541,550	.53	102
		FS-Reg.	12,564	11,265	4,691,868	.90	373
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	34,417	12,708	3,858,496	.37	112
		EQ-ERA	3,328	5,844	2,190,917	1.76	658
		F-CCC	19,741	21,426	3,254,404	1.09	165
	Second	Total	96,783	62,954	18,343,943	.65	190
		FS-Reg.	8,082	4,549	1,360,710	.56	168
		EQ-ERA	1,376	1,381	204,383	1.00	149
		FS-ERA	1,949	1,678	154,764	.86	79
		F-CCC	2,587	3,279	232,829	1.27	90
		Total	13,994	10,887	1,952,686	.78	140
	Third	FS-Reg.	633	216	75,265	.34	119
		EQ-ERA	192	352	10,513	1.83	55
		Total	825	568	85,778	.69	104
	All Workings	FS-Reg.	21,279	16,030	6,127,843	.75	288
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	34,417	12,708	3,858,496	.37	112
		EQ-ERA	4,896	7,577	2,405,813	1.55	491
		FS-ERA	1,949	1,678	154,764	.86	79
		F-CCC	22,328	24,705	3,487,233	1.11	156
Idaho and Washington	First	Total	111,602	74,409	20,382,407	.67	183
		EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	23,709	28,732	7,496,701	1.21	316
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	106,552	36,574	10,290,872	.34	97
		EQ-ERA	83,924	54,446	10,509,694	.65	125
		FS-ERA	15,853	10,139	1,880,647	.64	119
		EQ-Coop.	111,150	30,929	8,750,877	.28	79
		F-CCC	74,165	57,804	9,633,542	.78	130
		S&P-CCC	112	748	209,356	6.68	1,869
	Second	Total	460,994	237,927	54,186,636	.52	118
		FS-Reg.	15,188	7,895	1,884,117	.52	124
		FS-NIRA	8,544	2,051	292,658	.24	34
		EQ-ERA	15,713	16,187	2,841,764	1.03	181
		FS-ERA	4,686	4,445	337,557	.95	72
		EQ-Coop.	4,955	3,628	453,912	.73	92
		F-CCC	6,893	12,789	1,353,115	1.86	196
		S&P-CCC	3,577	3,842	743,055	1.07	208
	Third	Total	59,556	50,837	7,906,178	.85	133
		FS-Reg.	842	345	93,209	.41	111
		EQ-ERA	4,300	5,795	387,852	1.35	90
		EQ-Coop.	1,378	1,324	350,082	.96	254
	All Workings	Total	6,520	7,464	831,143	1.14	127
		EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	39,739	36,972	9,474,027	.93	238
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	115,096	38,625	10,583,530	.34	92
		EQ-ERA	103,937	76,428	13,739,310	.74	132
		FS-ERA	20,539	14,584	2,218,204	.71	108
		EQ-Coop.	117,483	35,881	9,554,871	.31	81
Idaho and Washington	First	F-CCC	81,058	70,593	10,986,657	.87	136
		S&P-CCC	3,689	4,590	952,411	1.24	258
		Total	527,070	296,228	62,923,957	.56	119

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1941
KANIKSU OPERATION

State	Working	Number of Acres Worked by Ownership Classes					
		Federal			State	Private	Total
		Forest Service	Public Domain	Total			
Idaho	First	184,979	54	185,033	110,916	68,262	364,211
	Second	24,261		24,261	12,961	8,340	45,562
	Third	104		104	4,778	813	5,695
	All Workings	209,344	54	209,398	128,655	77,415	415,468
Washington	First	68,053		68,053	2,080	26,650	96,783
	Second	12,950		12,950		1,044	13,994
	Third	633		633		192	825
	All Workings	81,636		81,636	2,080	27,886	111,602
Idaho and Washington	First	253,032	54	253,086	112,996	94,912	460,994
	Second	37,211		37,211	12,961	9,384	59,556
	Third	737		737	4,778	1,005	6,520
	All Workings	290,980	54	291,034	130,735	105,301	527,070

TABLE 10

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1941
KANIKSU OPERATION

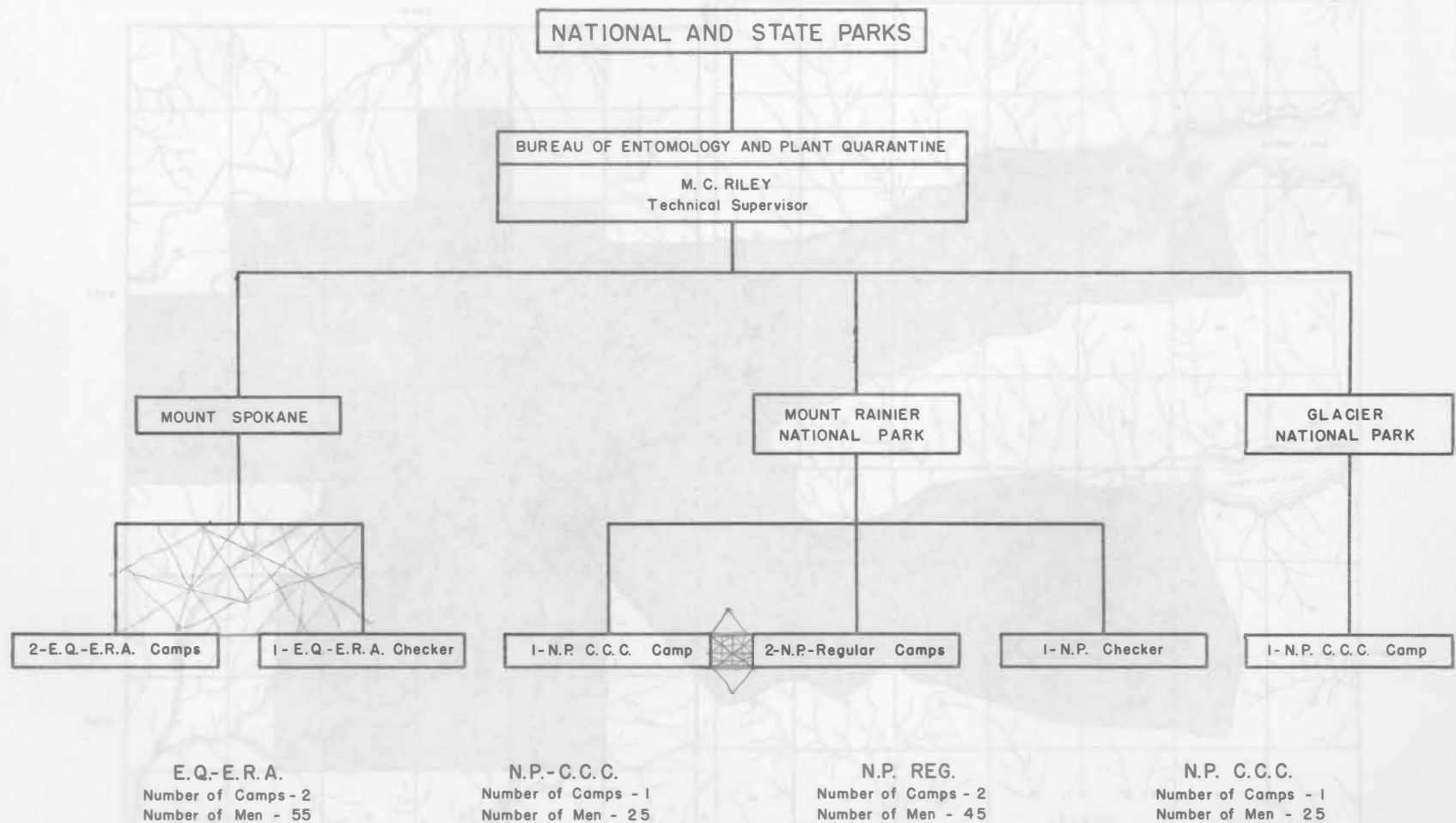
State	Ownership Class	Number of Acres			Acres Mature Stands on Which Working Is Deferred	Total Acres White Pine
		Worked	Unworked	Total		
Idaho	Forest Service	184,979	43,704	228,683	26,202	254,885
	Public Domain	54	506	560		560
	Subtotal Federal	185,033	44,210	229,243	26,202	255,445
	State	110,916	17,524	128,440	30	128,470
	Private	68,262	44,058	112,320	5,390	117,710
	Total	364,211	105,792	470,003	31,622	501,625
Washington	Forest Service	68,053	31,257	99,310		99,310
	State	2,080	2,030	4,110		4,110
	Private	26,650	11,575	38,225		38,225
	Total	96,783	44,862	141,645		141,645
Idaho and Washington	Forest Service	253,032	74,961	327,993	26,202	354,195
	Public Domain	54	506	560		560
	Subtotal Federal	253,086	75,467	328,553	26,202	354,755
	State	112,996	19,554	132,550	30	132,580
	Private	94,912	55,633	150,545	5,390	155,935
	Total	460,994	150,654	611,648	31,622	643,270

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1923-1941
KANIKSU OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	Ribes irriguum	Ribes acerifolium	
First	Open Reproduction	139,520	7,963,403	21,099,446	158,106	2,947		29,223,902
	Dense Reproduction	22,524	1,234,765	398,962	66,295			1,700,022
	Open Pole	98,977	2,483,095	2,632,075	186,047	21,192	3,914	5,326,323
	Dense Pole	21,327	268,016	111,257	22,388	522		402,183
	Open Mature	110,494	3,704,730	1,526,083	122,722		2,027	5,355,562
	Dense Mature	31,047	295,808	87,912	31,739			415,459
	Cutover	8,183	517,676	603,790	45,004			1,166,470
	Brush	3,599	68,387	203,158	64,562			336,107
	Burn	1,132	153,516	790,402	3,956			947,874
	Subalpine	1,933	116,392	40,111	19			156,522
	Meadow-Field	71						
	All Upland	438,807	16,805,788	27,493,196	700,838	24,661	5,941	45,030,424
	Stream	22,187	4,857,640	424,045	3,854,943		19,584	9,156,212
	All Types	460,994	21,663,428	27,917,241	4,555,781	24,661	25,525	54,186,636
Second	Open Reproduction	29,615	1,193,339	3,282,960	26,808			4,503,107
	Dense Reproduction	2,336	133,367	53,987	1,518			188,872
	Open Pole	11,903	223,712	220,792	8,297			452,801
	Dense Pole	2,541	39,530	8,641	2,476			50,647
	Open Mature	4,515	139,415	141,853	3,216			284,484
	Dense Mature	601	13,802	3,613	658			18,073
	Cutover	2,408	348,938	1,085,395	10,103			1,444,436
	Brush	596	15,641	11,326	875			27,842
	Subalpine	50	461	127				588
	Meadow-Field	10	72					72
	All Upland	54,575	2,108,277	4,808,694	53,951			6,970,922
	Stream	4,981	484,646	46,488	404,122			935,256
	All Types	59,556	2,592,923	4,855,182	458,073			7,906,178
	Open Reproduction	5,853	206,514	507,060	1,284			714,858
	Dense Reproduction	60	1,305	73,488				74,793
Third	Dense Pole	21	43	51				94
	Open Mature	105	713	671				1,384
	Cutover	51	4,025	680	5,001			9,706
	Brush	64	391	867				1,258
	All Upland	6,154	212,991	582,817	6,285			802,093
	Stream	366	24,807	4,044	199			29,050
	All Types	6,520	237,798	586,861	6,484			831,143
	Open Reproduction	174,988	9,363,256	24,889,466	186,198	2,947		34,441,867
	Dense Reproduction	24,920	1,369,437	526,437	67,813			1,963,687
	Open Pole	110,880	2,706,807	2,852,867	194,344	21,192	3,914	5,779,124
All Workings	Dense Pole	23,889	307,589	119,949	24,864	522		452,924
	Open Mature	115,114	3,844,858	1,668,607	125,938		2,027	5,641,430
	Dense Mature	31,648	309,610	91,525	32,397			433,532
	Cutover	10,642	870,639	1,689,865	60,108			2,620,612
	Brush	4,259	84,419	215,351	65,437			365,207
	Burn	1,132	153,516	790,402	3,956			947,874
	Subalpine	1,983	116,853	40,238	19			157,110
	Meadow-Field	81	72					72
	All Upland	499,536	19,127,056	32,884,707	761,074	24,661	5,941	52,803,439
	Stream	27,534	5,367,093	474,577	4,259,264		19,584	10,120,518
	All Types	527,070	24,494,149	33,359,284	5,020,338	24,661	25,525	62,923,957

ORGANIZATION CHART



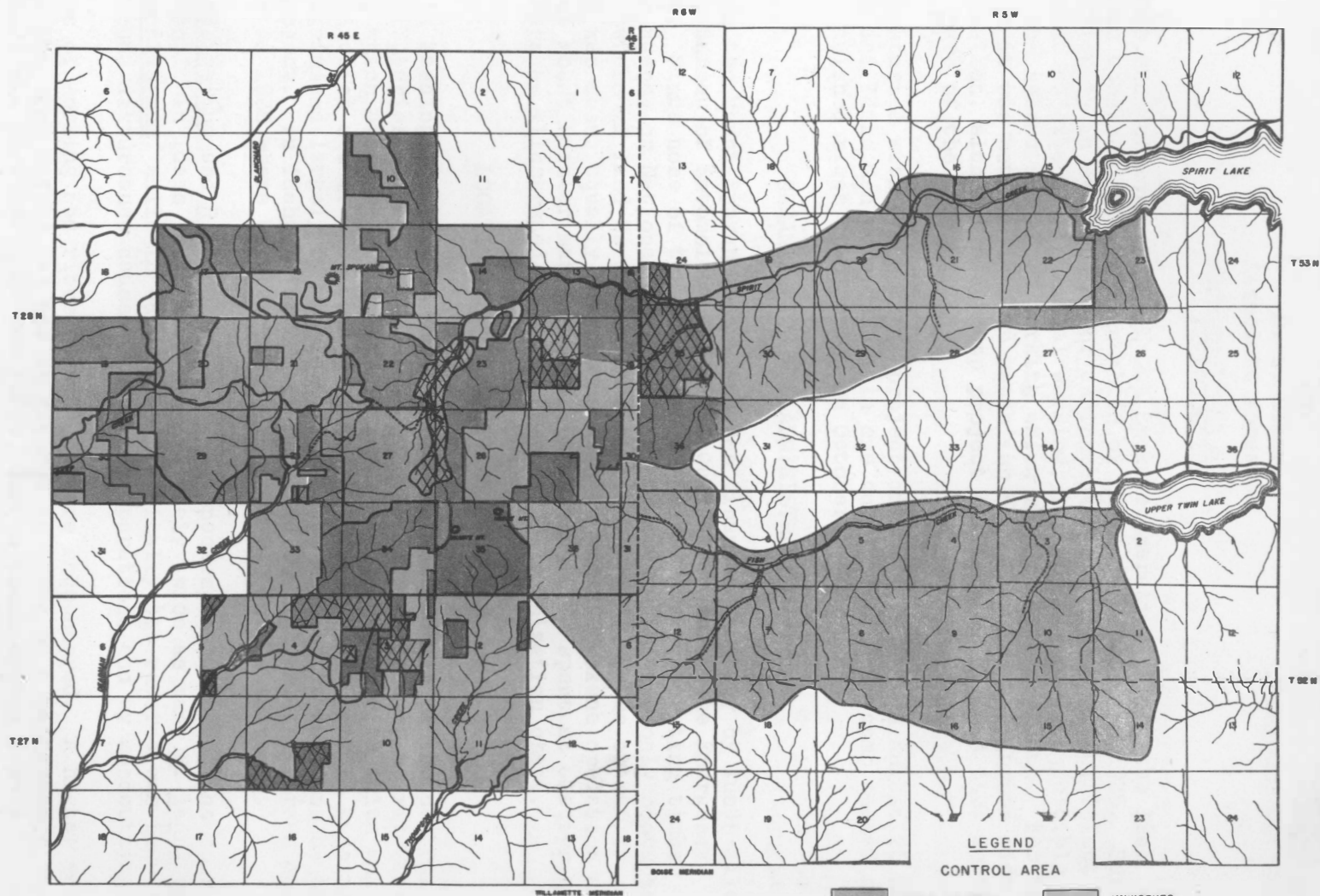
Total Number of Men on Blister Rust Work - 150

MT. SPOKANE OPERATION

BLISTER RUST CONTROL WORKING AREA

SCALE 1 MILE

WILLAMETTE AND BOISE MERIDIANS



LEGEND

CONTROL AREA

- | | |
|----------------|-----------|
| FIRST WORKING | UNWORKED |
| SECOND WORKING | 1941 WORK |
| THIRD WORKING | |

BLISTER RUST CONTROL WORK, MOUNT SPOKANE OPERATION, 1941

By

M. C. Riley

Associate Forester

INTRODUCTION

Blister rust control work on the Mount Spokane operation during the 1941 field season consisted of a continuation of the work started in 1935. Due to the difficulty in securing labor assignments there were not sufficient men available to extend the initial working; in fact, it was not possible to do all of the second and third working which should have been done. For the same reason it was not feasible to establish a camp on the Washington side of the operation, although a noncamp project of 12 to 22 men was used during the first part of the season.

Field work started with the noncamp project on April 18 and on August 25 the Washington and Idaho men were placed in one camp. The Idaho camp opened on May 1 and finished ribes eradication on October 7.

ORGANIZATION AND ADMINISTRATION

All work on the Mount Spokane operation was financed entirely by funds allotted to the Bureau of Entomology and Plant Quarantine under the Emergency Relief Act. Since none of the lands are a part of any cooperating timber protective agency or National Forest administrative unit, the only co-operators were owners of land used as a camp site. The time of the operation supervisor was about equally divided between the Mount Spokane operation and the work at Mount Rainier National Park, with some time spent at Glacier National Park as illustrated in the accompanying organization chart.

LOCATION AND DESCRIPTION OF AREAS

The work in Washington centered around the southwest corner of the control area on tributaries of Deadman Creek and at the extreme head of Spirit Creek on both of which areas second and third working was done on high value white pine reproduction areas. The choice of the location of the work in Washington was determined largely by accessibility since much of it was done by the noncamp project. In Idaho efforts were confined to high priority areas worked originally in 1938 where blister rust infection was on the increase.

Ribes viscosissimum and R. lacustre were the species found during the course of the season. In Idaho there were approximately twice as many R. lacustre as R. viscosissimum, while in Washington practically the reverse was true due to more ground disturbance caused by logging operations and by woodcutting.

All classes of working and ribes conditions were encountered. A higher percentage of the area worked can now be classed as being on a maintenance basis than has been the case the last few years, due to there having been a higher percentage of third working than has been the case before. On the other hand, some small areas continue to show seedling occurrence even after third working due to continued disturbance of the soil.

The effects of the 1937 wave of infection were apparent this season and as a result it was difficult to find an area or drainage without infection. However, no new heavy centers were found and the exterior limits of infection were not extended.

METHODS AND EQUIPMENT

All eradication work was performed by the hand pulling method. It was the constant aim of all concerned to reduce costs and improve efficiency. It was possible to lay string lines in advance to a greater extent than formerly and a specially trained crew was engaged in this and in mop-up work continually with satisfactory results.

CHECKING

Checking work was conducted on the basis of a four per cent sample to give immediate and detailed information on the condition of the areas. Advance surveys were conducted on all areas worked and practically the entire worked area was given a regular check. Due to employment limitations it was not possible to employ a checker for the entire season and as a result not as much post check was accomplished as in former years. Whenever possible the checkers assisted the camp bosses in laying out crew divisions, assisting with rework areas and supervising regular eradication work.

CANKER ELIMINATION

When, because of weather conditions, it became impossible to do any further effective ribes eradication work, the crew started canker elimination. The men were given careful training in canker identification, method of canker removal, identification of killing cankers and the amount of pruning to be done on each tree. It was found that approximately the same width of strip could be used for the same number of men per crew as in ribes eradication and it was also found feasible to lay string lines in advance. The areas where this work was conducted were all of the open reproduction type and were excellent sites for the growth of white pine. One area was very heavily infected and it is estimated that about 12 per cent of the trees were removed because of killing cankers. On most of the areas the majority of the infection was of 1937 origin, and was of sufficient age for heavy aeciospore production in 1941. Canker elimination work started on October 7 and ended on December 31.

A total of 680 acres was covered in 813 man-days. There were 425,993 trees treated, of which 12,852 were removed. On a per acre basis, it required 1.20 effective man-days to treat 626 trees, including an average of 19 trees per acre which were removed because of killing cankers.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the following tables:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941
MOUNT SPOKANE OPERATION

Cooperating Agency	Appropriation	Amount
Bureau of Entomology and Plant Quarantine	Regular	\$ 2,722.79
	Idaho-ERA	11,541.29
	Wash.-ERA	9,263.78
Total		\$23,527.86

TABLE 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941
MOUNT SPOKANE OPERATION

Item	Bureau of Entomology and Plant Quarantine		
	Regular	ERA	Total
Salaries, permanent men	\$2,496.11		\$ 2,496.11
Salaries, temporary men		\$ 4,126.99	4,126.99
Wages, temporary laborers		13,531.75	13,531.75
Subsistence supplies	153.45	2,424.28	2,582.73
Equipment		109.55	109.55
Travel and transportation	65.97	305.18	371.15
Other supplies	2.26	307.32	309.58
Total	\$2,722.79	\$20,805.07	\$23,527.86

TABLE 2A

DISTRIBUTION OF BLISTER RUST CONTROL EXPENDITURES
BY PROGRAMS
MOUNT SPOKANE OPERATION

Program	Number of Effective Man-Days	Expenditures According to Fund		Effective Man-Day Cost
Planning, Coordination and Technical Direction		EQ-Reg.	\$ 2,496.11	
EQ-ERA	1,961	EQ-ERA	14,943.34	\$7.74
		EQ-Reg.	226.68	
		Total	15,170.02	
Canker Elimination	313	EQ-ERA	5,361.73	7.21
Total Cost of 1941 Program			\$23,527.86	

Number of meals served	13,089
Average cost per meal	\$0.155
Pounds of twine used	361

SUMMARY OF RIBES ERADICATION, 1941
MOUNT SPOKANE OPERATION

TABLE 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes	Ribes Remaining Per Acre	
						Bushes	Live Stem
Open Reproduction	480	498	978	1,151	75,202	3.6	4.8
Dense Reproduction		6	6	5	48	0	0
Open Pole	268	180	448	444	87,038	.9	.2
Dense Pole		15	15	11	363	0	0
Open Mature		26	26	74	27,452		
Brush	48	25	73	116	8,551	0	0
All Upland	796	750	1,546	1,801	198,654	.7	1.0
Stream (Hand)	63	29	92	160	19,993	7.4	9.3
All Types	859	779	1,638	1,961	218,647	.9	1.2

TABLE 3B - SECOND WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man-Days	Ribes	Bushes	Live Stem
Open Reproduction	480	671	31,048	1.40	65	.6	1.6
Open Pole	268	189	26,505	.71	99	.2	.4
Brush	48	100	8,056	2.08	168	0	0
All Upland	796	960	65,609	1.21	82	.5	1.2
Stream (Hand)	63	103	9,818	1.63	156	7.4	9.3
All Types	859	1,063	75,427	1.24	88	.8	1.1

TABLE 3C - THIRD WORKING

Open Reproduction	498	480	44,154	.96	89	6.8	8.3
Dense Reproduction	6	5	48	.83	8	0	0
Open Pole	180	255	60,533	1.42	336	.2	.1
Dense Pole	15	11	363	.73	24	0	0
Open Mature	26	74	27,452	2.85	1,056		
Brush	25	16	495	.64	20	0	0
All Upland	750	841	133,045	1.12	177	1.4	.2
Stream (Hand)	29	57	10,175	1.97	351	1.7	2.7
All Types	779	898	143,220	1.15	184	1.5	1.4

TABLE 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1941
MOUNT SPOKANE OPERATION

State	Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
						Man-Days	Ribes	Bushes	Live Stem
Idaho	Second	EQ-ERA	556	851	49,322	1.53	89	1.1	2.2
Washington	Second	EQ-ERA	303	212	26,105	.70	86	.2	.4
	Third	EQ-ERA	779	898	143,220	1.15	184	1.5	1.4
	All Workings	EQ-ERA	1,082	1,110	169,325	1.03	156	1.0	1.0
Idaho and Washington	Second	EQ-ERA	859	1,063	75,427	1.24	88	.8	1.5
	Third	EQ-ERA	779	898	143,220	1.15	184	1.5	1.4
	All Workings	EQ-ERA	1,638	1,961	218,647	1.20	133	1.0	1.3

TABLE 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1941
MOUNT SPOKANE OPERATION

State	Working	Number of Acres Worked by Bureau of Entomology and Plant Quarantine			Total
		Public Domain	State	Private	
Idaho	Second	53	207	296	556
Washington	Second			303	303
	Third			779	779
	Total			1,082	1,082
Total	Second	53	207	599	859
	Third			779	779
	Total	53	207	1,378	1,638

TABLE 6

TOTAL RIBES BY SPECIES ERADICATED, 1941
MOUNT SPOKANE OPERATION

Working	Eradication Type	Acres	Ribes by Species		Total Ribes
			Ribes lacustre	Ribes viscosissimum	
Second	Open Reproduction	480	22,626	8,422	31,048
	Open Pole	268	4,400	22,105	26,505
	Brush	48	71	7,985	8,056
	All Upland	796	27,097	38,512	65,609
	Stream	63	9,791	27	9,818
	All Types	859	36,888	38,539	75,427
Third	Open Reproduction	498	18,359	25,795	44,154
	Dense Reproduction	6	12	36	48
	Open Pole	180	14,413	46,120	60,533
	Dense Pole	15	110	253	363
	Open Mature	26	11,684	15,768	27,452
	Brush	25	154	341	495
	All Upland	750	44,732	88,313	133,045
	Stream	29	8,638	1,537	10,175
	All Types	779	53,370	89,850	143,220
All Workings	Open Reproduction	978	40,985	34,217	75,202
	Dense Reproduction	6	12	36	48
	Open Pole	448	18,813	68,225	87,038
	Dense Pole	15	110	253	363
	Open Mature	26	11,684	15,768	27,452
	Brush	73	225	8,326	8,551
	All Upland	1,546	71,829	126,825	198,654
	Stream	92	18,429	1,564	19,993
	All Types	1,638	90,258	128,389	218,647

SUMMARY OF RIBES ERADICATION, 1935-1941
MOUNT SPOKANE OPERATION

TABLE 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man-Days	Total Ribes
Open Reproduction	8,032	4,297	1,856	14,185	29,806	8,411,894
Dense Reproduction	376	215	75	666	957	260,703
Open Pole	8,932	4,188	1,792	14,912	16,195	3,945,456
Dense Pole	754	231	26	1,011	474	75,982
Open Mature	1,076	727	157	1,960	3,620	758,108
Dense Mature	735	102		837	185	34,017
Cutover	526	760	186	1,472	2,015	972,489
Brush	1,924	649	280	2,853	3,137	402,942
Subalpine	515	181	88	784	502	100,944
All Upland	22,870	11,350	4,460	38,680	56,891	14,962,535
Stream (Hand)	507	285	29	821	3,494	1,069,551
All Types	23,377	11,635	4,489	39,501	60,385	16,032,086

TABLE 7A - FIRST WORKING

Eradication Type	Acres	Effective Man-Days	Total Ribes	Per Acre Basis Man-Days	Ribes
Open Reproduction	8,032	23,220	7,196,194	2.89	896
Dense Reproduction	376	592	170,078	1.57	452
Open Pole	8,932	11,407	3,114,515	1.28	349
Dense Pole	754	331	59,815	.44	79
Open Mature	1,076	2,667	542,489	2.48	504
Dense Mature	735	165	33,155	.22	45
Cutover	526	710	236,846	1.35	450
Brush	1,924	1,923	289,058	1.00	150
Subalpine	515	334	85,746	.65	166
All Upland	22,870	41,349	11,727,896	1.81	513
Stream (Hand)	507	2,962	990,922	5.84	1,955
All Types	23,377	44,311	12,718,818	1.90	544

TABLE 7B - SECOND WORKING

Open Reproduction	4,297	4,966	852,030	1.16	198
Dense Reproduction	215	290	61,681	1.35	287
Open Pole	4,188	3,479	619,590	.83	148
Dense Pole	231	122	15,418	.53	67
Open Mature	727	770	161,095	1.06	222
Dense Mature	102	20	862	.20	8
Cutover	760	1,092	669,650	1.44	881
Brush	649	1,047	96,236	1.61	148
Subalpine	181	129	9,850	.71	54
All Upland	11,350	11,915	2,486,412	1.05	219
Stream (Hand)	285	475	68,454	1.67	240
All Types	11,635	12,390	2,554,866	1.06	220

TABLE 7C - THIRD WORKING

Open Reproduction	1,856	1,620	363,670	.87	196
Dense Reproduction	75	75	28,944	1.00	386
Open Pole	1,792	1,309	211,351	.73	118
Dense Pole	26	21	749	.81	29
Open Mature	157	183	54,524	1.17	347
Cutover	186	213	65,993	1.15	355
Brush	280	167	17,648	.60	63
Subalpine	88	39	5,348	.44	61
All Upland	4,460	3,627	748,227	.81	168
Stream (Hand)	29	57	10,175	1.97	351
All Types	4,489	3,684	758,402	.82	169

TABLE 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1935-1941
MOUNT SPOKANE OPERATION

State	Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis Man-Days	Ribes
Idaho	First	EQ-ERA	5,282	14,974	4,835,292	2.83	915
	Second	EQ-ERA	1,091	1,559	125,083	1.43	115
	All Workings	EQ-ERA	6,373	16,533	4,960,375	2.59	778
Washington	First	EQ-ERA	18,095	29,337	7,883,526	1.62	436
	Second	EQ-ERA	10,544	10,831	2,429,783	1.03	230
	Third	EQ-ERA	4,489	3,684	758,402	.82	169
	All Workings	EQ-ERA	33,128	43,852	11,071,711	1.32	334
Idaho and Washington	First	EQ-ERA	23,377	44,311	12,718,818	1.90	544
	Second	EQ-ERA	11,635	12,390	2,554,866	1.06	220
	Third	EQ-ERA	4,489	3,684	758,402	.82	169
	All Workings	EQ-ERA	39,501	60,385	16,032,086	1.53	406

TABLE 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1935-1941
MOUNT SPOKANE OPERATION

State	Working	Number of Acres Worked by Ownership Classes					
		Federal			State	Private	Total
		Forest Service	Public Domain	Total			
Idaho	First	310	170	480	1,258	3,544	5,282
	Second		53	53	616	422	1,091
	Total	310	223	533	1,874	3,966	6,373
Washington	First		315	315	4,752	13,028	18,095
	Second		60	60	3,935	6,549	10,544
	Third				2,114	2,375	4,489
	Total		375	375	10,801	21,952	33,128
Total	First	310	485	795	6,010	16,572	23,377
	Second		113	113	4,551	6,971	11,635
	Third				2,114	2,375	4,489
	Total	310	598	908	12,675	25,918	39,501

TABLE 10

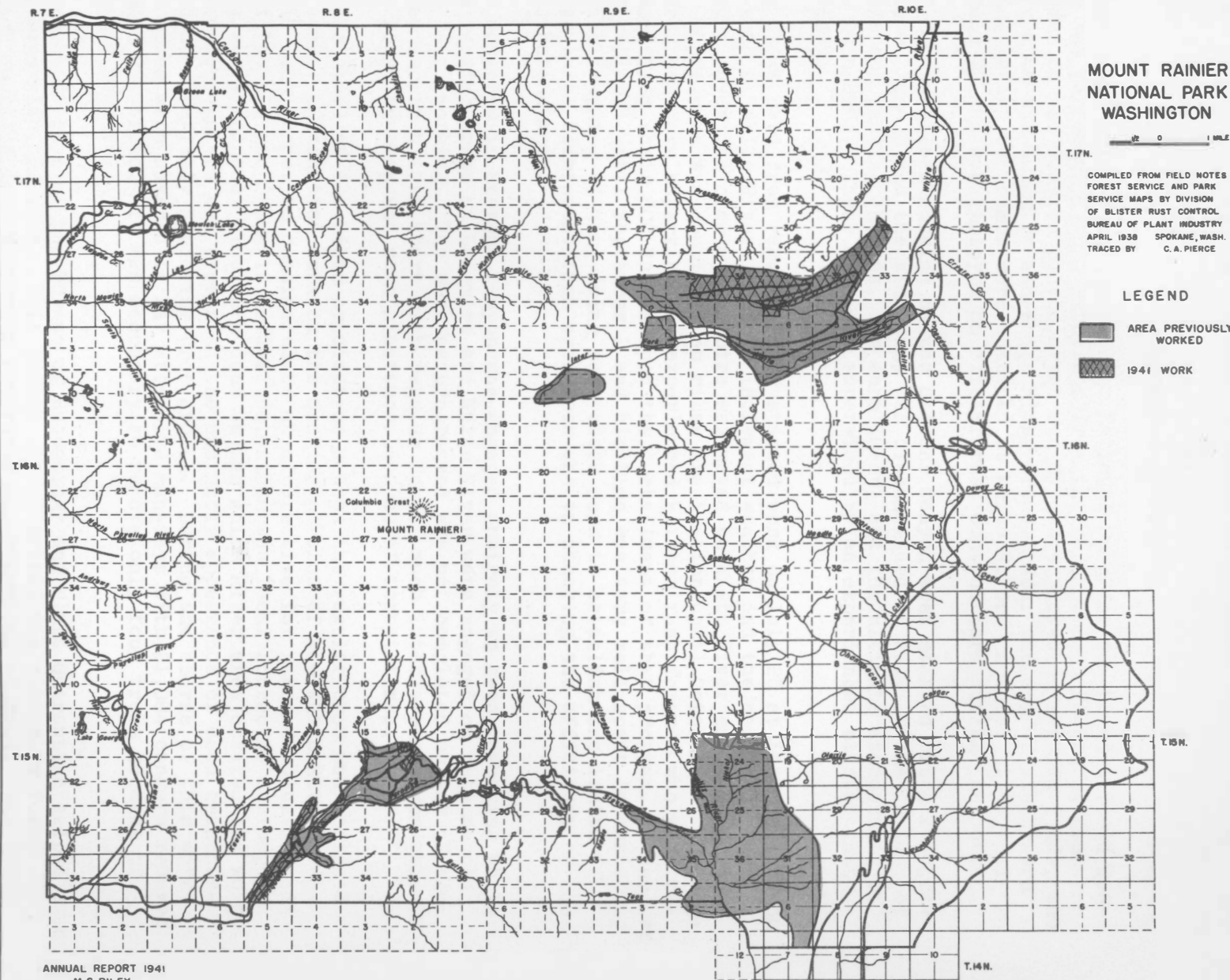
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1935-1941
MOUNT SPOKANE OPERATION

State	Ownership Class	Number of Acres		
		Worked	Unworked	Total
Idaho	Forest Service	310	80	390
	Public Domain	170	255	425
	Subtotal Federal	480	335	815
	State	1,258	467	1,725
	Private	3,544	9,426	12,970
	Total	5,282	10,228	15,510
Washington	Public Domain	315		315
	State	4,752	988	5,740
	Private	13,028	367	13,395
	Total	18,095	1,355	19,450
Total	Forest Service	310	80	390
	Public Domain	485	255	740
	Subtotal Federal	795	335	1,130
	State	6,010	1,455	7,465
	Private	16,572	9,793	26,365
	Total	23,377	11,583	34,960

TABLE 11

TOTAL RIBES BY SPECIES ERADICATED, 1935-1941
MOUNT SPOKANE OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	
First	Open Reproduction	8,032	2,185,192	4,998,337	12,665	7,196,194
	Dense Reproduction	376	145,551	24,527		170,078
	Open Pole	8,932	1,503,900	1,610,615		3,114,515
	Dense Pole	754	34,973	24,842		59,815
	Open Mature	1,076	259,455	283,034		542,489
	Dense Mature	735	11,281	21,874		33,155
	Cutover	526	136,659	100,187		236,846
	Brush	1,924	85,890	203,168		289,058
	Subalpine	515	46,423	39,323		85,746
	All Upland	22,870	4,409,324	7,305,907	12,665	11,727,896
	Stream	507	690,118	67,807	232,997	990,922
	All Types	23,377	5,099,442	7,373,714	245,662	12,718,818
Second	Open Reproduction	4,297	258,025	594,005		852,030
	Dense Reproduction	215	52,484	9,197		61,681
	Open Pole	4,188	248,486	371,104		619,590
	Dense Pole	231	6,476	8,942		15,418
	Open Mature	727	48,455	112,640		161,095
	Dense Mature	102	463	399		862
	Cutover	760	340,267	329,383		669,650
	Brush	649	40,536	55,700		96,236
	Subalpine	181	4,970	4,880		9,850
	All Upland	11,350	1,000,162	1,486,250		2,486,412
	Stream	285	65,110	3,344		68,454
	All Types	11,635	1,065,272	1,489,594		2,554,866
Third	Open Reproduction	1,856	160,480	203,190		363,670
	Dense Reproduction	75	23,538	5,406		28,944
	Open Pole	1,792	81,376	129,975		211,351
	Dense Pole	26	264	485		749
	Open Mature	157	20,420	34,104		54,524
	Cutover	186	49,466	16,527		65,993
	Brush	280	4,911	12,737		17,648
	Subalpine	88	2,510	2,838		5,348
	All Upland	4,460	342,965	405,262		748,227
	Stream	29	8,638	1,537		10,175
	All Types	4,489	351,603	406,799		758,402
All Workings	Open Reproduction	14,185	2,603,697	5,795,532	12,665	8,411,894
	Dense Reproduction	666	221,573	39,130		260,703
	Open Pole	14,912	1,833,762	2,111,694		3,945,456
	Dense Pole	1,011	41,713	34,269		75,982
	Open Mature	1,960	328,330	429,778		758,108
	Dense Mature	837	11,744	22,273		34,017
	Cutover	1,472	526,392	446,097		972,489
	Brush	2,853	131,337	271,605		402,942
	Subalpine	784	53,903	47,041		100,944
	All Upland	38,680	5,752,451	9,197,419	12,665	14,962,535
	Stream	821	763,866	72,688	232,997	1,069,551
	All Types	39,501	6,516,317	9,270,107	245,662	16,032,086



BLISTER RUST CONTROL WORK
MOUNT RAINIER NATIONAL PARK, 1941

By

M. C. Riley

Associate Forester

Ribes eradication on Mount Rainier National Park during the 1941 field season was performed by CCC enrollees from the main camp at Packwood, who worked on the Stevens Canyon area, and by men employed on regular funds, who worked on the Longmire and White River areas. Near the end of the season these latter two camps were combined at White River. A total of approximately 97 men was employed on blister rust control work during the season.

The CCC enrollees working on the Stevens Canyon area started ribes eradication on June 5 and the side camp was discontinued on July 15 due to lack of funds for packing charges, low enrollment, and the ultimate abandonment of the main camp. These men were supervised by an experienced blister rust foreman.

The crews paid from regular funds started work on July 25 at Longmire and on July 28 at White River. Due to inclement weather and the nature of the ground cover the crew at Longmire was moved to White River early in September where work was continued on ribes eradication until October 1. The regular crews were supervised by experienced blister rust foremen who were released from their CCC duties upon the curtailment of that program. A checker was employed until September 1 and his time was very well spent in assisting in the training of men, doing post check work to establish the limits of areas to be eliminated from crew work and in checking the efficiency of the eradication work.

The CCC crew in Stevens Canyon was engaged entirely in second working while the regular crews at Longmire and White River were engaged on both second and third working. The work as programmed was not completed on any of the areas due to a late start with regular funds, much interference from rain on the Longmire area and some hindrance because of forest fires.

At the close of the ribes eradication season the regular crew was assigned to canker elimination work on the Sunrise portion of the White River area. While this cannot be considered as an alternative for ribes eradication, it is felt that much benefit is derived, since the local source of aeciospores is greatly reduced. The work done on the White River area covered the worst infection centers and prevented the unsightly appearance of dead branches without materially hindering tree growth. During the course of this work 776 acres were covered in 247 effective man-days with 21,084 cankers removed from 4,991 trees. It was necessary to remove only four trees because of killing cankers.

A representative of the Bureau of Entomology and Plant Quarantine helped plan and supervise the work. This Bureau also supplied the necessary forms and office supplies for the proper recording and reporting of data. The Chief Ranger was placed in charge of all blister rust work within the park by the Superintendent and this greatly facilitated the more orderly and efficient organization and progress of the program.

For the 1942 season the minimum requirements would be a crew of at least 20 men to spend half of the season doing urgent rework on the White River area and half of the season doing equally urgent rework on the Longmire area. If it is decided to continue rework in the Stevens Canyon area at least 35 additional men will be needed for the entire season.

The following tables show statements of expenditures, results of the field work for 1941, and accumulative results for all work done to date:

TABLE 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1941
MOUNT RAINIER NATIONAL PARK

Cooperating Agency	Appropriation	Amount
National Park Service	Regular	\$8,780.63
	Total	8,780.63
Bureau of Entomology and Plant Quarantine	Regular	329.93
	Wash.-ERA	82.00
	Total	911.93
All Agencies	Total	\$9,692.56

TABLE 1A

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1941
MOUNT RAINIER NATIONAL PARK

Item	National Park Service	Bureau of Entomology and Plant Quarantine			Total
	Regular	Regular	ERA	Total	
Sal. perm. men		\$825.00		\$825.00	\$ 825.00
Sal. temp. men	\$1,525.00				1,525.00
Wages, temp. labs.	6,530.55				6,530.55
Equipment	359.07				359.07
Travel and transp.	48.71	2.58	\$82.00	84.58	133.29
Other supplies	317.30	2.35		2.35	319.65
Total	\$8,780.63	\$829.93	\$82.00	\$911.93	\$9,692.56

TABLE 2

SUMMARY OF RIBES ERADICATION, 1941
MOUNT RAINIER NATIONAL PARK

Area	Working	Eradication Type	Acres	Effective Man-Days	Ribes by Species						Total	Per Acre Basis	
					Ribes lacustre	Ribes viscosissimum	Ribes bracteosum	Ribes watsonianum	Ribes laxiflorum	Ribes acerifolium		Man-Days	Ribes
Stevens Canyon	Second	Stream	42	404	18		30,432				30,450	9.61	725
Longmire	Third	Open Reproduction	42	99	7,819		245		15	257	8,336	2.36	198
		Stream	96	246	6,168		5,389			46	11,603	2.56	121
		All Types	138	345	13,987		5,634		15	303	19,939	2.50	144
White River	Second	Open Pole	280	195		7		15	129	4,504	4,655	.70	17
	Third	Open Pole	959	639	860	2,556		10,274	20	557	14,267	.67	15
	All Workings	Open Pole	1,239	834	860	2,563		10,289	149	5,061	18,922	.67	15
All Areas	Second	Open Pole	280	195		7		15	129	4,504	4,655	.70	17
		Stream	42	404	18		30,432				30,450	9.61	725
		All Types	322	599	18	7	30,432	15	129	4,504	35,105	1.86	109
	Third	Open Reproduction	42	99	7,819		245		15	257	8,336	2.36	198
		Open Pole	959	639	860	2,556		10,274	20	557	14,267	.67	15
		All Upland	1,001	738	8,679	2,556	245	10,274	35	814	22,603	.74	23
		Stream	96	246	6,168		5,389			46	11,603	2.56	121
		All Types	1,097	984	14,847	2,556	5,634	10,274	35	860	34,206	.90	31
		Open Reproduction	42	99	7,819		245		15	257	8,336	2.36	198
	All Workings	Open Pole	1,239	834	860	2,563		10,289	149	5,061	18,922	.67	15
		All Upland	1,281	933	8,679	2,563	245	10,289	164	5,318	27,253	.73	21
		Stream	138	650	6,186		35,821			46	42,053	4.71	305
		All Types	1,419	1,583	14,865	2,563	36,066	10,289	164	5,364	69,311	1.12	49

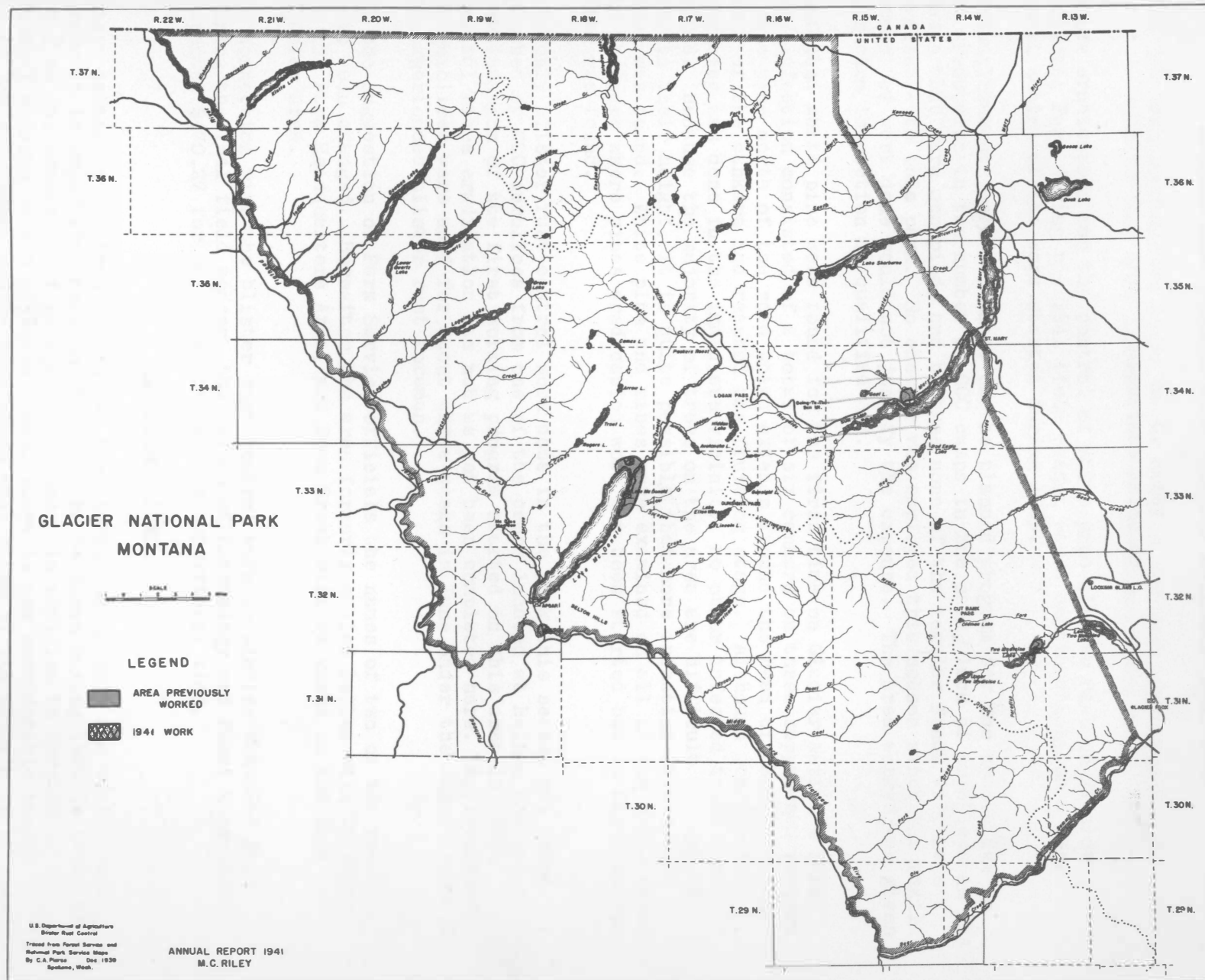
TABLE 3

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1930-1941
MOUNT RAINIER NATIONAL PARK

Working	Class	Acres	Effective Man-Days	Total Ribes	Per Acre Basis	
					Man-Days	Ribes
First	NP-Reg.	2,647	3,806	780,171	1.44	295
	NP-CCC	5,607	6,264	860,336	1.12	154
	Total	8,254	10,070	1,640,507	1.22	199
Second	NP-Reg.	318	267	14,310	.84	45
	NP-CCC	4,262	5,372	381,518	1.26	90
	Total	4,580	5,639	395,828	1.23	86
Third	NP-Reg.	1,097	984	34,206	.90	31
	NP-CCC	1,091	1,056	51,313	.97	47
	Total	2,188	2,040	85,519	.93	39
All Workings	NP-Reg.	4,062	5,057	828,687	1.24	204
	NP-CCC	10,960	12,692	1,293,167	1.16	118
	Total	15,022	17,749	2,121,854	1.18	141

TABLE 4
SUMMARY OF RIBES ERADICATION, 1930-1941
MOUNT RAINIER NATIONAL PARK

Working	Area	Eradication Type	Acres	Effective Man-Days	Ribes by Species									Total Ribes	Per Acre Basis	
					Ribes lacustre	Ribes viscosissimum	Ribes bracteosum	Ribes watsonianum	Ribes laxiflorum	Ribes acerifolium	Ribes sanguineum	Ribes triste	Man-Days		Ribes	
First	Longmire	Open Reproduction	274	397	40,281		1,101		5,409	5,804			52,595	1.45	192	
		Stream	526	1,202	185,687		97,774		53,899	2,838	16		340,214	1.92	543	
		All Types	900	1,599	225,968		98,875		59,308	8,642	16		392,809	1.73	436	
		Open Reproduction	2,531	218	28,071		15,986				7,915		51,972	.09	22	
		Open Pole	704	38	175		1,052				16		1,244	.05	2	
		All Upland	3,055	256	28,247		17,038				7,931		53,216	.08	17	
	Stevens Canyon	Stream	1,192	4,741	72,360	2,055	440,386		914	11	3,959		519,685	3.98	436	
		All Types	4,247	4,997	100,607	2,055	457,424		914	11	11,890		572,901	1.18	135	
		Open Reproduction	66	50	6,869	239	21	1,133	550	194			9,006	.76	136	
		Open Pole	1,870	2,087	173,780	59,529	539	139,238	1,189	10,801	91	744	395,911	1.12	212	
		Open Mature	322	254	27,327	12,847		5	45				40,224	.82	125	
		All Upland	2,258	2,401	207,373	82,615	560	140,371	1,744	11,040	91	744	445,141	1.06	197	
	White River	Stream	423	744	152,855	1,510	4,869	242	8,820	188	98	8	178,591	1.75	422	
		All Types	2,681	3,145	370,832	84,125	5,429	140,613	10,564	11,328	189	752	623,732	1.17	233	
		Open Reproduction	48	21	68	7		7		2,305			2,387	.44	50	
		Open Pole	332	252	11,276	6,131		6,723	3,221	16,658			44,009	.79	133	
		All Upland	380	283	11,344	6,138		6,730	3,221	18,963			46,396	.74	122	
		Stream	46	46	2,653	575		476	546	409			4,659	1.00	102	
	Starbo	All Types	426	329	14,007	6,713		7,206	3,767	19,372			51,065	.77	120	
		Open Reproduction	2,739	686	75,289	246	17,108	1,140	5,959	8,303	7,915		115,960	.25	42	
		Open Pole	2,906	2,387	185,232	75,660	1,591	145,961	4,410	27,459	107	744	441,164	.82	152	
		Open Mature	322	254	27,327	12,847							40,224	.82	125	
		All Upland	5,787	3,337	287,848	88,753	13,699	147,101	10,374	35,807	5,022	744	597,348	.56	100	
		Stream	2,287	5,743	423,556	4,140	543,029	718	54,179	3,446	4,073	8	1,043,159	2.94	456	
	All Areas	All Types	8,254	10,070	711,414	92,893	561,728	147,819	74,553	39,253	12,095	752	1,640,507	1.22	199	
		Open Reproduction	203	97	9,744		1,101						10,845	.48	53	
		Stream	614	526	19,277		23,196		2,394	1,426	50		47,043	.86	77	
All Types		817	623	29,721		24,297		2,394	1,426	50		57,888	.76	71		
Open Reproduction		787	2,532	49,131	95	171,224				607		221,067	3.22	281		
Open Pole		66	12	221			77					298	.18	5		
Second	White River	All Upland	2,194	1,768	36,284	14,304	2,176	6,864	16,224	4,537			80,389	.81	37	
		Open Mature	322	47	1,278	2,011							3,289	.15	10	
		All Upland	2,582	1,827	37,783	16,315	2,176	6,941	16,224	4,537			83,976	.71	33	
		Stream	394	657	32,748		154		5				32,907	1.67	84	
		All Types	2,976	2,484	70,531	16,315	2,330	6,941	16,229	4,537			116,883	.83	39	
		Open Reproduction	269	109	9,965		1,101	77					11,143	.41	41	
	All Areas	Open Pole	2,194	1,768	36,284	14,304	2,176	6,864	16,224	4,537			80,389	.81	37	
		Open Mature	322	47	1,278	2,011							3,289	.15	10	
		All Upland	2,785	1,924	47,527	16,315	3,277	6,941	16,224	4,537			94,821	.69	34	
		Stream	1,735	3,715	101,855	95	194,574		2,393	1,426	557		301,007	2.07	168	
		All Types	4,580	5,639	149,383	16,410	197,851	6,941	18,623	5,963	657		395,828	1.23	86	
		Open Reproduction	42	99	7,819		245		15	287			8,336	2.36	198	
	Longmire	Stream	489	472	15,619		6,562		316	46	6		22,549	.97	46	
		All Types	531	571	23,438		6,807		331	303	6		30,885	1.08	58	
		Stream	220	551	712		23,384						24,096	2.50	110	
Third	Stevens Canyon	Open Pole	959	639	860	2,556		10,274	20	557			14,267	.67	15	
		Stream	478	279	13,281	2,253	34		703				16,271	.58	34	
		All Types	1,437	918	14,141	4,809	34	10,274	723	557			30,538	.64	21	
	White River	Open Reproduction	42	99	7,819		245		15	287			8,336	2.36	198	
		Open Pole	959	639	860	2,556		10,274	20	557			14,267	.67	15	
		All Upland	1,001	738	8,672	2,556	245	10,274	35	814			22,603	.74	28	
		Stream	1,187	1,302	29,612	2,253	29,280		1,019	46	6		62,916	1.10	53	
		All Types	2,188	2,040	38,291	4,809	30,325	10,274	1,054	860	6		55,519	.93	39	
		Open Reproduction	519	593	57,844		2,447		5,424	6,061			71,776	1.14	138	
	Longmire	Stream	1,729	2,200	221,283		127,532		56,609	4,310	72		409,806	1.27	237	
		All Types	2,248	2,793	279,127		129,979		62,033	10,371	72		481,582	1.24	214	
		Open Reproduction	2,351	218	28,071		15,986				7,915		51,972	.09	22	
Open Pole		704	38	176		1,052				16		1,244	.05	2		
All Upland		3,055	256	28,247		17,038				7,931		53,216	.08	17		
Stream		2,199	7,824	122,203	2,150	634,994		914	11	4,566		764,838	3.56	348		
All Workings	Stevens Canyon	All Types	5,254	8,080	150,450	2,150	652,032		914	11	12,497		818,054	1.54	156	
		Open Reproduction	132	62	7,090	239	21	1,210	550	194			9,304	.47	70	
		Open Pole	5,023	4,494	210,924	96,389	2,715	156,376	17,433	15,895	91	744	490,567	.89	98	
		Open Mature	644	311	28,605	14,858			5	45			43,513	.48	68	
		All Upland	5,799	4,867	245,619	101,486	2,735	157,586	17,988	16,134	91	744	543,384	.84	94	
		Stream	1,295	1,680	208,885	3,763	5,057	242	9,528	188	98	8	227,769	1.30	175	
	White River	All Types	7,094	6,547	455,504	105,249	7,793	157,828	27,516	16,322	189	752	771,153	.92	109	
		Open Reproduction	48	21	68	7		7		2,305			2,387	.44	50	
		Open Pole	332	252	11,276	6,131		6,723	3,221	16,658			44,009	.79	133	
		All Upland	380	283	11,344	6,138		6,730	3,221	18,963			46,396	.74	122	
		Stream	46	46	2,653	575		476	546	409			4,659	1.00	102	
		All Types	426	329	14,007	6,713		7,206	3,767	19,372			51,065	.77	120	
	Starbo	Open Reproduction	3,050	894	93,073	246	18,454	1,217	5,974	8,560	7,915		135,439	.29	44	
		Open Pole	6,059	4,794	222,376	92,520	3,767	163,099	20,654	32,553	107	744	535,820	.79	88	
		Open Mature	644	311	28,605	14,858			5	45			43,513	.48	68	
		All Upland	9,753	5,999	344,054	107,624	22,221	164,316	26,633	41,158	8,022	744	714,772	.62	73	
		Stream	5,289	11,750	555,034	6,488	757,583	718	67,597	4,918	4,736	8	1,407,082	2.23	287	
		All Types	15,022	17,749	899,088	114,112	789,804	165,034	94,230	46,076	12,768	752	2,121,854	1.18	141	



BLISTER RUST CONTROL WORK, GLACIER NATIONAL PARK, 1941

By

M. C. Riley

Associate Forester

Ribes eradication for the control of white pine blister rust on Glacier National Park during the 1941 field season was a continuation, on a very small scale, of the work started during 1939.

Accomplishments were far short of the planned program for the season due to the reduction in the number of CCC camps in the park, lack of enrollees in the camps that were occupied, and because none of the regular funds were made available to this park. No checker was employed this season since the small amount of work done would not justify the expense. The area worked was given a random inspection by qualified men.

Infected white pine were found for the first time on Glacier National Park. The infection consisted of a total of six cankers on three suppressed western white pine north of the road which extends around the head of Lake McDonald. None of the cankers had reached the fruiting stage. Although considerable scouting was done in the immediate vicinity, no other infected trees were found. Because the majority of trees on the area are difficult to inspect due to their height, it is quite possible that more infection exists here than was found. White pine and ribes were examined on all of the other areas in the park where ribes eradication work has been started but no other infection was found.

The only blister rust control work done in the park this season was accomplished by CCC enrollees from one of the camps located at Belton and was a continuation of the first working program started on this area in 1939. Initial ribes eradication has not as yet been completed here. Approximately 25 enrollees were used for about three weeks in June under the supervision of an experienced blister rust foreman.

At the suggestion of Park Service officials the names of two of the areas have been changed. Hereafter the area formerly called Belton will be known as the Park Headquarters Area, and Roes Creek will be known as the East Glacier Area.

In connection with the blister rust control work in Glacier National Park during the 1941 field season, the Bureau of Entomology and Plant Quarantine expended \$470.27 for salaries, travel and supervisory time.

RECOMMENDATIONS

Since initial ribes eradication has been completed on only one of the four areas it is imperative that positive action be taken during 1942 in order to realize the advantage of work already done. In addition to furnishing the initial working on the selected areas, there is now considerable rework needed on every area and in some cases this phase of the program is at least one year behind schedule. On none of the areas where work has been started is it considered that the complete acreage is on a maintenance basis.

TABLE 1

SUMMARY OF RIBES ERADICATION, 1941
GLACIER NATIONAL PARK

Area	Eradication Type	Acres	Effective Man-Days	Ribes by Species			Total Ribes	Per Acre Basis	
				Ribes lacustre	Ribes viscosissimum	Ribes setosum		Man-Days	Ribes
Lake McDonald	Open Mature	54	34	154	347	360	861	.63	16
	Stream	6	17	553		1,602	2,155	2.83	359
	All Types	60	51	707	347	1,962	3,016	.85	50

TABLE 2

SUMMARY OF RIBES ERADICATION, 1939-1941
GLACIER NATIONAL PARK

Area	Eradication Type	Acres	Effective Man-Days	Ribes by Species				Total Ribes	Per Acre Basis	
				Ribes lacustre	Ribes viscosissimum	Ribes setosum	Ribes inerme		Man-Days	Ribes
Park Headquarters	Open Reproduction	358	204	9,869	6,472	15,666		32,007	.57	89
	Open Pole	284	122	13,428	15,364	8,967		37,759	.43	133
	Brush	39	119	9,411	21,340	8,353		39,104	3.05	1,003
	All Types	681	445	32,708	43,176	32,986		108,870	.65	160
Two Medicine	Open Pole	346	389	16,774	2,573	1,723	2,853	23,923	1.12	69
	Subalpine	60	118	3,935	1,050	4,665	1,834	11,484	1.97	191
	All Upland	406	507	20,709	3,623	6,388	4,687	35,407	1.25	87
	Stream	49	464	28,325	434		12,315	41,074	9.47	838
Lake McDonald	All Types	455	971	49,034	4,057	6,388	17,002	76,481	2.13	168
	Open Mature	683	744	17,255	3,948	29,230		50,433	1.09	74
	Dense Mature	717	140	3,192	79	327		3,598	.20	5
	All Upland	1,400	884	20,447	4,027	29,557		54,031	.63	39
East Glacier	Stream	11	39	5,184	35	1,602		6,821	3.54	620
	All Types	1,411	923	25,631	4,062	31,159		60,852	.65	43
	Open Pole	86	494	24,077	5,650	6,738	41,173	77,638	5.74	903
	Open Reproduction	358	204	9,869	6,472	15,666		32,007	.57	89
All Areas	Open Pole	716	1,005	54,279	23,587	17,428	44,026	139,320	1.40	195
	Open Mature	683	744	17,255	3,948	29,230		50,433	1.09	74
	Dense Mature	717	140	3,192	79	327		3,598	.20	5
	Brush	39	119	9,411	21,340	8,353		39,104	3.05	1,003
	Subalpine	60	118	3,935	1,050	4,665	1,834	11,484	1.97	191
	All Upland	2,573	2,330	97,941	56,476	75,669	45,860	275,946	.91	107
	Stream	60	503	33,509	469	1,602	12,315	47,895	8.38	798
	All Types	2,633	2,833	131,450	56,945	77,271	58,175	323,841	1.08	123

SCOUTING FOR BLISTER RUST IN YELLOWSTONE NATIONAL PARK
AND ADJACENT AREAS, 1941

By
Edward L. Joy, Forester

In order to keep a close check on the spread of blister rust into the white-bark (Pinus albicaulis), and limber pine (P. flexilis) stands of northwestern Wyoming and adjacent Montana, this general region was scouted in July and August, 1941. Major efforts were placed on areas within Yellowstone and Grand Teton National Parks in which the establishment of control on selected areas is planned for the near future. Additional scouting was performed on areas bordering the parks with special emphasis placed on National Forest lands adjacent to the northwest corner of the Yellowstone. This included careful coverage of the Bear Creek drainage on the Gallatin National Forest where ribes infection only 19 miles from the park boundary was found in 1937.

Although thousands of Ribes petiolare bushes and several hundred whitebark and limber pine trees growing in major drainages of the area were examined, no blister rust was found. This includes inspection in drainages in which solid and continuous clumps of R. petiolare and closely associated five-needle pines occur for distances up to several miles. In addition to this excellent association of the most susceptible species of wild ribes and pines known, moisture and wind current conditions in these drainages are particularly favorable for the development and spread of the disease.

The 1941 season of potential rust spread into this region, which probably extended from May to September, was exceptionally wet. Rains fell during much of each month with unusually heavy downpours very common. It was probably because of the extent and severity of these storms and the accompanying prevention of air-current spore dissemination over long distances that there was very little if any rust spread southeastward from the heavy north Idaho pine infection centers. This abundant precipitation could also be a deterrent to shorter distance spread such as within a drainage or between adjacent drainages but probably such local spread would not be as completely stopped since favorable periods occur between storms. The fact that no rust could be found under conditions that probably were quite favorable for local spread leads to the conclusion that centers of spore-producing pine infection are either very few in number or totally absent in the region scouted.

These results are interpreted to mean that the northwestern Wyoming and adjacent Montana forests still represent the rust invasion front with the strong likelihood that the next zone, in which rust intensification is taking place, lies to the northwest somewhere in Montana. From the fact that ribes infections were quite readily found in the Bitterroot and Wise River ranges of the Beaverhead National Forest during 1937, it is probable that these districts now harbor centers of mature pine infection and fall into this zone. If this is true, the nearest source of spores for spread to Yellowstone National Park is now less than 100 miles or only about one-half the distance from the nearest north Idaho centers.

PREERADICATION SURVEY OF SELECTED AREAS
IN GRAND TETON NATIONAL PARK, 1941

By

Edward L. Joy, Forester

Grand Teton National Park was first given consideration with respect to white pine blister rust control work in 1934 when a preliminary survey of five-needle or white pines and ribes on forested areas in Colorado and Wyoming was made. As a result of that work this park was included as one of the forest units with white pines of considerable value as recreational and watershed area cover. The total area of land with the better stands of these pines was at that time estimated to be about 2,000 acres.

The probability of rust invasion in the northwestern Wyoming five-needle pine stands, based on the discovery of the disease nearby in 1937 and the knowledge that not many years can pass before considerable infection will result, made it advisable to plan for the early establishment of control on Grand Teton National Park areas. For this purpose a partial preeradication survey of the park areas was conducted in 1941 by technicians of the Bureau of Entomology and Plant Quarantine. Although a complete report on this work has been prepared and submitted to the National Park Service, the major points are herein recorded.

AREAS SURVEYED

In the main, Grand Teton National Park is a wilderness area reached only by trails through deep-cut canyons, up steep, rugged slopes, and along high ridges. Consequently those areas of five-needle pines that are immediately adjacent to these trails are of primary importance and were designated for first attention. At the same time the importance of "front slope" stands, or those on the east-facing slopes which constitute the upper-elevation timber cover visible from the main highway through Jackson Hole, was sufficient to justify their inclusion for consideration. With this as a guide inspection or sample stripping to secure basic information for control estimates was accomplished for all areas designated. Due to the fact that all living accommodations are on the Jackson Hole Valley floor, travel time to the areas is considerable and unusually wet weather prevailed, it was possible to give the areas only extensive coverage in the time allowable. However sufficient data for preliminary estimates of the initial eradication or first working were secured for ten areas. Estimates on rework are not made at this time but this phase of the project for all areas will probably require at least 50 per cent of the initial working time.

The ten areas surveyed are as follows:

Trail-Side Areas

1. Glacier Trail
2. Death Canyon-Teeter Ridge
3. Alaska Basin (Targhee N. F.)
4. South Fork of Cascade Creek
5. North Fork of Cascade Creek
6. Paintbrush Canyon - Holly Lake

Front-Slope Areas

1. East Horn
2. Paintbrush to Cascade
3. Cascade to Glacier
4. Garnet to Avalanche

FIVE-NEEDLE PINES

Although both Pinus albicaulis, whitebark pine, and P. flexilis, limber pine, occur in the park, the former is more abundant and is the principal species of all ten areas. In the lower elevations where P. flexilis occurs, it is a minor associate of other conifers which together would provide an adequate timber cover without the limber pine. In the higher reaches, however, whitebark pine is the major species and constitutes the principal cover on many areas. This is indicated from the Vegetation Type survey records for the park which show 10,220 acres of whitebark pine, the largest amount in any timber type in the park.

RIBES

At several places within Grand Teton National Park veritable ribes gardens exist. One of these is in Death Canyon on the lower edge of the Death Canyon-Teeter Ridge areas where the five major ribes species of the park are to be found. These are Ribes petiolare, western black currant; R. inerme, white stemmed gooseberry; R. lacustre, prickly currant; R. montigenum, alpine currant; and R. viscosissimum, sticky currant. Adding two additional species, R. cereum, squaw currant, and R. setosum, bristly gooseberry, that grow in the lower elevations, the total ribes flora for this locality is seven species.

All surveyed areas support some ribes, chief of which are R. viscosissimum, R. montigenum, and R. lacustre. In general these species occur in light to medium populations with heavy patches only occasional.

SURVEY RESULTS

Data for the ten areas surveyed, which are summarized in table 1, are presented in two groups. The first consists of the six trail-side areas and the second, the four front-slope areas. All estimates are for regular funds operated camps.

The ten areas surveyed are as follows:

Trail-Side Areas	Front-Slope Areas
1. Grand Teton Trail	1. Grand Teton Trail
2. Death Canyon-Teeter Ridge	2. Death Canyon-Teeter Ridge
3. Snake River (Lower N. T.)	3. Snake River (Lower N. T.)
4. South Fork of Snake River	4. South Fork of Snake River
5. North Fork of Snake River	5. North Fork of Snake River
6. Polaris Peak Canyon - Holly Lake	6. Polaris Peak Canyon - Holly Lake

TABLE 1

SUMMARY OF CONTROL ESTIMATES
FOR GRAND TETON NATIONAL PARK AREAS

Area	Acres	Ribes Per Acre	*Total 8-hr. Man-Days
Glacier Trail	400	75-100	500
Death Canyon-Teeter Ridge	600	100-125**	1,150
Alaska Basin	500	25-50	350
South Fork Cascade Creek	800	50-100	800
North Fork Cascade Creek	450	25-50	300
Paintbrush Canyon-holly Lake	700	50-75	700
Total Major Areas	3,450		3,800
East Horn	500	25-50	500
Paintbrush to Cascade	700	200-250	1,050
Cascade to Glacier	700	25-50	700
Garnet to Avalanche	450	25-50	450
Total Front-Slope Areas	2,350		2,700
Grand Total	5,800		6,500

*Man-days include only the actual time to be spent on ribes removal.

**Estimate for upland area only. Stream type ribes classed "Heavy".

PINE DISEASE SURVEY AND SCOUTING FOR WHITE PINE
BLISTER RUST IN THE INLAND EMPIRE, 1941

By
R. L. MacLeod
Associate Pathologist

INTRODUCTION

During the past four years pine disease survey and post check work were sometimes performed on the same area. As the pine disease survey includes the data taken on the post check it was considered advisable to combine these two types of survey on areas requiring both types during the same year. Pine disease survey work in 1941 was therefore placed under the direct supervision of the checking supervisor on each operation.

Plot study work was continued under the supervision of C. R. Stillinger.

A. Pine Disease Survey

The results of the 1941 pine disease survey are shown by operations in table 1. Descriptions of areas covered by the survey are included in the individual operation reports.

B. Scouting for the Rust

In the Inland Empire the year 1941 was characterized by excessive moisture throughout the field season. It was a favorable year for local rust intensification but not so favorable for long-distance spread. The longer periods of more or less continuous rain may have been unfavorable for spread but many intervening periods of high humidity were favorable for intensification. With pine infection prevalent over all of the Inland Empire white pine belt, ribes infection was general and could be located readily even in areas where ribes bushes were small and scattered.

That the year was not favorable for long distance spread particularly to the southeast, is evidenced by the fact that six man weeks of scouting in heavy Ribes petiolare areas on Yellowstone and Grand Teton National Parks failed to reveal the presence of the rust.

RESULTS

The amount of work accomplished in the Inland Empire is shown by operations in table 1.

TABLE 1
PINE DISEASE SURVEY, 1941
SUMMARY BY OPERATIONS

Operation	Miles of Strip	White Pine			Cankers	
		Number Examined	Infected		Number	Per 100 Trees
			Number	Per Cent		
Clearwater	7.9	3,022	1,232	40.7	7,324	242.4
St. Joe	32.0	17,923	856	4.8	1,144	6.4
Coeur d'Alene	192.1	89,443	251	.3	273	.3
Kaniksu	32.2	74,379	4,571	6.2	*	
Total	314.2	184,767	6,910	3.7	*	

*Data incomplete

BLISTER RUST PLOT STUDIES

By

C. R. Stillinger

Assistant Pathologist

INTRODUCTION

The program for obtaining information on white pine blister rust by means of permanent plot studies, as a supplement to the extensive surveys for ribes and pine distribution and infection, was continued during the 1941 field season. Besides the regular inspection of all ribes on those plots where this was part of the work program, the number of ribes on one plot was reduced. Also, plot work was started for the first time on the Kaniksu operation by the establishment of five new plots. The pertinent information which has been compiled will be given in the discussion for each plot. All data for the new plots are only tentative since they are the result of rapid initial surveys.

BLISTER RUST CONDITIONS IN 1941

This past season undoubtedly will prove to be another very favorable year for the intensification of the rust because of the frequent rains distributed throughout the summer as well as the fact that the infection on the white pine which took place in 1937 reached its greatest volume of aecial production this year. Table 1 reveals that in 1941 more rust was present on the ribes, a higher percentage of the ribes bushes was infected and there was a greater average amount of rust per infected leaf than in 1940.

TABLE 1

COMPARISON OF AMOUNT OF RIBES INFECTION IN 1940 AND 1941

Plot	Operation	Per Cent Ribes Infected		Per Cent Leaves Infected		Sq. In. Inf. Per Leaf	
		1940	1941	1940	1941	1940	1941
Powder House Plot	Clearwater	43.5	50.7	18.5	17.2	.15	.17
Trail Creek Plot 6	Clearwater	32.7	77.6	6.1	24.4	.07	.06
Trail Creek Plot 3	Clearwater	27.7	50.0	0.4	0.5	.05	.07
E. Emerald Plot 18	St. Joe	50.0	100.0	1.9	18.4	.02	.05
E. Emerald Plot 19	St. Joe	100.0	100.0	49.0	61.0	.04	.06
E. Emerald Plot 20	St. Joe	67.0	100.0	6.6	22.4	.06	.41

PERTINENT RESULTS FROM INDIVIDUAL PLOTS

Kalispell Creek Plots 24, 25 and 26

Kalispell Creek plots 24, 25 and 26 were established during the past summer on the Kaniksu operation in a 1933 white pine planting. This area was burned in 1926 and the snags were felled and burned in 1932. Plot 24 is located in

the SE. $\frac{1}{4}$ of the SE. $\frac{1}{2}$ of sec. 14 and the other two in the NW. $\frac{1}{4}$ of the NW. $\frac{1}{4}$ of sec. 24, all in T. 36 N., R. 4 E., W.M. The general views shown in pictures W 222, W 215 and W 216 give a good idea of the conditions on each of the plots. Table 2 gives a summary of the principal facts regarding each plot as found in 1941.

TABLE 2

SUMMARY OF DATA FOR KALISPELL CREEK PLOTS 24, 25 AND 26
KANIKSU OPERATION

Items			Plot 24	Plot 25	Plot 26
Area - Acres			29.7	8.7	9.6
White Pine Per Acre			222 *	357	437
Per Cent Pines Infected			5.7*	5.3	4.3
Ribes	Total	lacustre	16	25	35
		viscosissimum	55	2	
	Per Acre		2.39	3.1	8.85
Feet of Live Stem	Total	lacustre	229	1,277	2,171
		viscosissimum	376	143	
	Per Acre		37.2	163	227
Ribes	Per Cent Lushes		71.8	96	63.5
Infection	Per Foot Live Stem, Sq. in.		2.3	.06	.01
	Per Bush, Sq. In.		3.6	3.2	.3

*Pine inspected on only one acre.

The ribes are quite generally distributed over the plots except for a few concentrations. No ribes eradication has been done on the area. The rust on the pine is all of 1937 origin and is uniformly distributed over the plots with very little indication of a pattern near any particular bush. That this type of distribution appears to be quite typical for the initial spread of the rust in an area is suggested by a similar initial distribution which has been found on some of the other plots.

The purpose of these plots will be to determine the effect of a small amount of ribes and feet of live stem per acre on the increase of the rust on pine by eradicating in 1942 part of the present ribes population.

The following observations from the preliminary data for the plots are worthy of note since the rust on all of these plots originated in 1937:

1. The number of pines on plot 26 is 97 per cent and on plot 25, 61 per cent greater than that of plot 24.
2. The per cent of pine infection on plot 26 is 75 per cent and on plot 25, 93 per cent of that of plot 24. In other words the amount of pine infection is not in proportion to the target.
3. The ribes per acre on plot 26 are 370 per cent and on plot 25, 130 per cent of those on plot 24. However, the increase in the number of ribes



W 222. Kalispell Creek plot 24. West half of the plot looking north. The flat area in the center of the picture is largely free from brush while the hillsides are covered with *Ceanothus velutinus*. Area planted to white pine 1933. White stakes mark location of individual ribes bushes.



W 215. Kalispell Creek plot 25. East half of plot. This is a north facing slope. The pine, planted in 1933, are distributed among natural reproduction of larch, white fir and aspens with very little underbrush.

per acre has not produced a corresponding increase in the amount of infection. In this connection it should be noted that plot 26 is entirely R. lacustre, plot 25 is almost all R. lacustre, while plot 24 is 77 per cent R. viscosissimum.

4. There does not appear to be any correlation between the ribes feet of live stem per acre and the rust on the ribes based on the amount of rust per foot of live stem.
5. There is some correlation between the number of ribes per acre and amount of rust present on plots 24 and 25 but not plot 26.

Kalispell Creek Plot 27

Kalispell Creek plot 27 was established this year on the Kaniksu operation in T. 36 N., R. 45 E., sec. 11 on the broad level bench just east of Diamond Peak in a dense natural reproduction stand of white pine with a considerable snag and pole overstory (Picture W 223). The purpose of this plot will be to study the rate of increase and distance of spread of the rust from 11 R. viscosissimum bushes of various sizes with different amounts of rust infection present around each bush. The bushes were selected previous to the eradication work done on the area in 1941, hence the area surrounding each bush should be free from ribes.

Reynolds Creek Plot 28

Reynolds Creek plot 28 was established on the Kaniksu operation on Reynolds Creek, in sec. 13, T. 60 N., R. 5 W., about a quarter mile southwest of the Kaniksu blister rust headquarters on Kalispell Bay. Reynolds Creek is a very small creek running through a small ravine. Yellow pine has been planted on the west side on a level bench about 50 feet above the stream and white pine on the east side on a rather steep west facing slope. Since these planted areas appear to be ribes-free and since an occasional R. lacustre was found along the stream, the situation represents an opportunity to study the uphill spread of blister rust from the R. lacustre in the stream bottom. Strip surveys in the white pine indicate that at present there is very little infection in the pine. Since the pine were planted in 1933 they are large enough so that damage to the pine from the study can be prevented. Seventeen ribes bushes were staked for the study.

Powder House Plot

The Powder House plot, located on the Clearwater operation, consists of approximately 95 acres of natural reproduction averaging about 12 years of age. About 250 ribes per acre were eradicated from this general area in 1933. A thorough examination of the area in 1939 and 1940 revealed an average of 1.74 ribes with 31 feet of live stem per acre. In 1940, some of the ribes without regard to species were eradicated, with the intention of eliminating all concentrations, as well as closely associated bushes. As a result the ribes are somewhat uniformly distributed over the area with an average of 0.73 bushes with 15 feet of live stem per acre.

During July a careful search for ribes was made by crews provided by the Clearwater operation in a zone approximately five chains in width around the plot. Thirty-four R. viscosissimum, 12 R. lacustre, and 4 R. petiolare were eradicated, the total averaging 0.5 ribes with 8 feet of live stem per acre. A considerable concentration was found on the north side of the plot while on the other sides, with one exception, only scattered bushes were found.

During August, 1941, all ribes on the plot were inspected. The results of this inspection, together with similar data for the same bushes in 1940, are given in table 3. From the totals for this plot the following points are of interest:

1. Although only half the bushes were infected this is seven per cent more than were infected in 1940.
2. There was an increase from 1940 to 1941 of approximately 100 feet in total live stem or approximately seven per cent.
3. The data for dead stem for the two years are not comparable. In 1940, only the dead part of main stems and branches were measured. In order to make the dead stem data more accurate, all such stem, including small spurs, was pruned off of each bush in 1941. Considering the figures for 1941 approximately five per cent of the live stem accumulated during the life of these ribes has died.
4. In 1941 there were seven per cent less leaves infected, ten per cent less rust per foot of live stem, but 13 per cent more rust per leaf than in 1940. These results indicate less aecial infection but more intensification on the infected leaves than occurred in 1940.

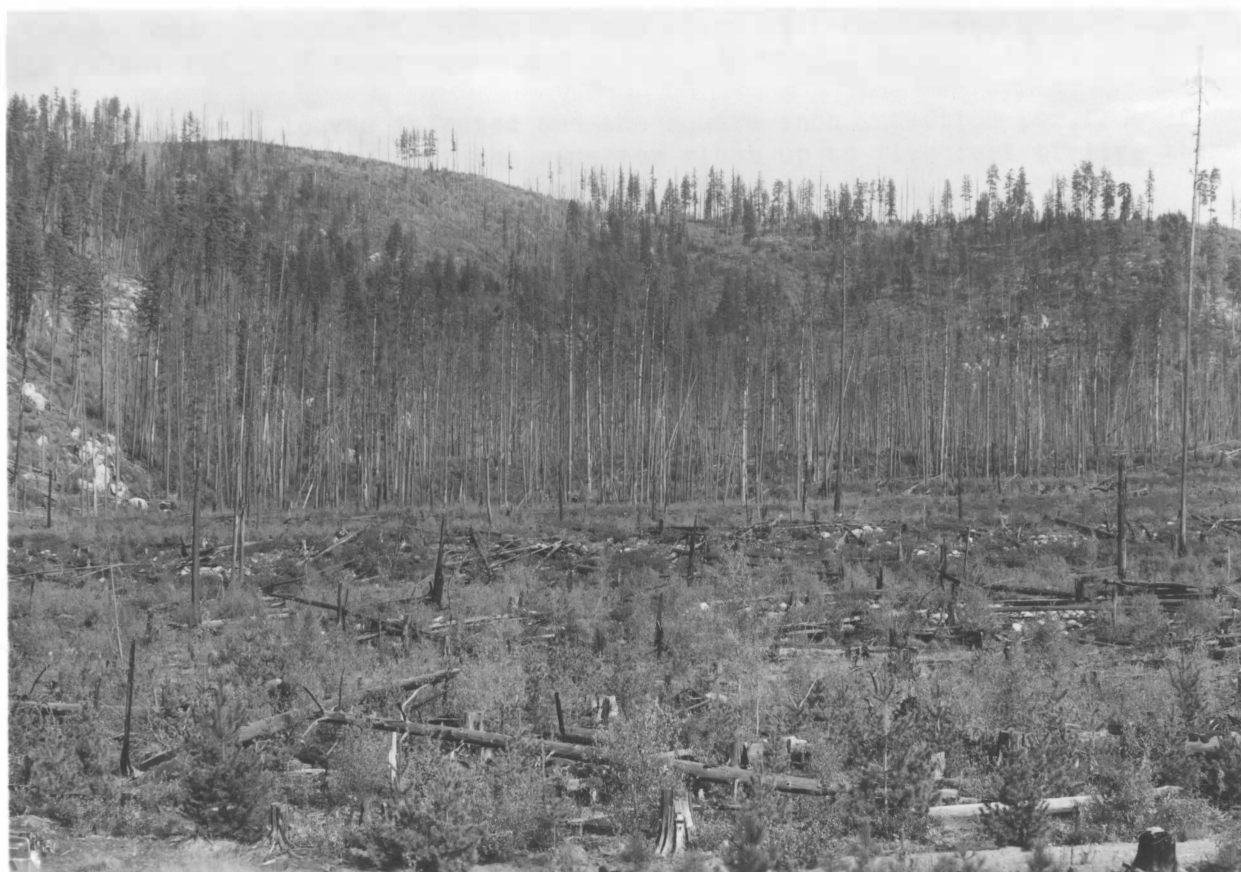
TABLE 3

SUMMARY OF RIBES INFECTION DATA
POWDER HOUSE PLOT, CLEARWATER OPERATION, 1940-1941

Year Insp.	Bushes		Feet of Stem			Leaves			Infection - Sq. In.		
	Total No.	No. Inf.	Live	Current Year	Dead	Total No.	No. Inf.	Per Cent Infected	Total	Per Inf. Leaf	Per FLS
Ribes lacustre											
1940	15	6	233.4	52.5	65.2	4,936	402	8.1	24.57	.06	.11
1941	15	11	266.3	68.3	105.1	4,240	585	13.8	36.19	.06	.14
Ribes viscosissimum											
1940	51	21	1,214.6	260.1	299.9	11,271	2,532	22.5	383.97	.15	.32
1941	51	22	1,282.8	344.3	703.8	10,458	1,941	18.6	386.11	.20	.30
Ribes petiolare											
1940	3	3	9.1	1.5	2.3	91	86	94.5	44.42	.52	4.88
1941	3	2	7.3	1.0	6.6	83	11	13.3	8.17	.74	1.12
All Species											
1940	69	30	1,457.1	314.1	367.4	16,293	3,020	18.5	452.96	.15	.31
1941	69	35	1,556.4	413.6	815.5	14,781	2,537	17.2	430.47	.17	.28
New Ribes Recorded First Time 1941 (Ribes viscosissimum)											
1941	1	1	2.0	0.8	0.5	31	3	9.7	0.10	.33	.05



W 216. Kalispell Creek plot 26. A general view of the south half of the plot looking northwest. A small stream runs through the center of the plot. The white stakes mark the locations of individual *Ribes lacustre* bushes. The larger trees evident on the hillside are native larch.



W 228. Kalispell Creek plot 27 is located in the residual stand on the level bench shown in the center of the picture. The foreground has been snagged, burned and planted to white pine while the reproduction beneath the overstory is dense natural white pine.

Trail Creek Plot 6

Trail Creek plot 6 is located on the Clearwater operation about seven miles north of Pierce, Idaho. The area on which the ribes are located is 1.6 acres in size and is well-stocked with white pine averaging 11 years of age. In continuation of the work plan all of the R. lacustre were inspected. After this inspection it was planned to reduce the number of ribes on this plot but due to the almost continuous rainy period which developed this was not done because of the probability that some infection had already taken place from the ribes.

The results of this inspection are given in table 4. A similar analysis for the ribes inspection for 1940 was given in table 2 in the 1940 report. Comparing the data for the two years some of the items of note are as follows:

1. The height classification of the bushes reveals that nearly 50 per cent of the bushes were six inches or less and 83 per cent 12 inches or less in height, yet all were old bushes.
2. This year 77.6 per cent of the ribes were infected as compared with 32.7 per cent in 1940.
3. The distribution of the ribes in the live stem classes remained approximately the same as last year.
4. The per cent of bushes infected in each class decreased with the decrease in height and in live stem.
5. The per cent of leaves infected and the square inch infection per foot of live stem remained somewhat the same for ribes up to five feet of live stem but decreased as bushes became larger.
6. The 1941 growth in inches per foot of live stem shows a remarkable uniformity in all classes.
7. The relation between feet of live stem and amount of rust developed this year is more nearly correlated than last year. This is to be expected because of the extremely moist summer. For example in the class with six inches or less of live stem, which accounts for 35.3 per cent of all bushes, there were 6.1 per cent of the live stem, 7.2 per cent of the leaves and 3.6 of the total rust.
8. The amount of the rust developed in 1941 was 3.48 times that present in 1940.

TABLE 4

SUMMARY OF DATA FOR RIBES LACUSTRE BY HEIGHT AND LIVE STEM CLASSES
TRAIL CREEK PLOT 6, CLEARWATER OPERATION
1941

	Classes in Inches												Total or Average
	0-6	7-12	13-18	19-24	25-36	37-48	49-60	61-72	73-84	85-96	97-108	109-over	
Height Classes													
No. Ribes	249	168	60	19	5								501*
% of Tot.	49.7	33.5	12.0	3.8	1.0								100
% Inf. of Tot.	33.9	28.2	11.1	3.6	.8								77.6
% Inf. of Class	68.0	83.9	94.7	66.7	100.0								77.6
Live Stem Classes													
No. Ribes	177	108	60	41	38	23	12	13	6	5	4	14	501*
% of Tot.	35.3	21.5	12.0	8.2	7.6	4.6	2.4	2.6	1.2	1.0	.8	2.8	100
% Inf. of Tot.	22.0	17.2	10.6	7.2	7.0	4.4	2.4	1.8	1.2	1.0	.4	2.6	77.6
% Inf. of Class	62.1	79.6	88.3	87.8	92.1	95.7	100.0	69.2	100.0	100.0	50.0	92.9	77.6
% of Tot. L. S.	6.1	9.1	8.6	8.1	10.6	9.0	6.0	7.9	4.4	4.2	3.7	22.3	100
% of Tot. Lvs.	7.2	8.8	8.5	7.1	9.3	7.3	6.1	7.4	3.8	3.7	4.0	26.8	100
% Inf. of Tot. Lvs.	2.0	2.8	2.7	2.0	2.5	2.6	2.0	1.1	.9	.9	.7	4.2	24.4
% Inf. in Class	28.0	31.6	32.0	27.9	27.3	35.2	32.3	14.1	24.4	25.1	17.2	15.7	24.4
% of Tot. Sq. In. of Inf.	8.6	13.4	11.4	10.2	14.2	13.5	7.9	3.3	3.0	2.5	.8	11.2	100
Sq. In. Inf. Per F. L. S.	.39	.41	.37	.35	.37	.42	.37	.12	.19	.23	.06	.14	.28
In. 1941 Growth Per F. L. S.	3.2	3.4	3.9	3.2	3.2	3.0	3.2	3.7	3.5	3.2	2.1	3.5	(Average) 3.3

*Last years report showed 507 bushes. This difference is due to dead bushes or bushes not found.

East Emerald Creek Plot 21

East Emerald Creek plot 21 is located in the SW. $\frac{1}{4}$ of the SW. $\frac{1}{4}$ of sec. 8, T. 42 N., R. 1 E., on the St. Joe operation. This 1.6 acre plot is on a 50 per cent north slope. The well-stocked white pine reproduction is approximately 12 years of age. In 1938 the inspection of all white pine on the plot revealed 56 per cent infection with white pine blister rust.

Ribes eradicated from this area in 1935 totaled 181 R. lacustre, 76 R. viscosissimum and 1 R. petiolare per acre. In reeradicating the ribes up to the edge of the plot in 1940, 98 R. lacustre, 17 R. viscosissimum and 1 R. petiolare per acre were removed.

A thorough check of the plot area for ribes was made in 1940 and all ribes found were staked and numbered. In 1941 the first complete inspection of all the ribes was made. After this inspection all ribes that were over one foot high or had more than 18 inches of live stem, except a few isolated bushes, were eradicated. This standard of eradication was decided upon since an examination of the checking records for several areas in the vicinity of the plot that were worked in 1940 indicated that bushes of the smaller sizes were the ones which the eradication crews were missing.

In table 5 is given an analysis of all the data secured in 1941 for the ribes on the plot. The ribes are classified into live stem classes and whether eradicated this year or left on the plot. The following points of interest are evident from the data:

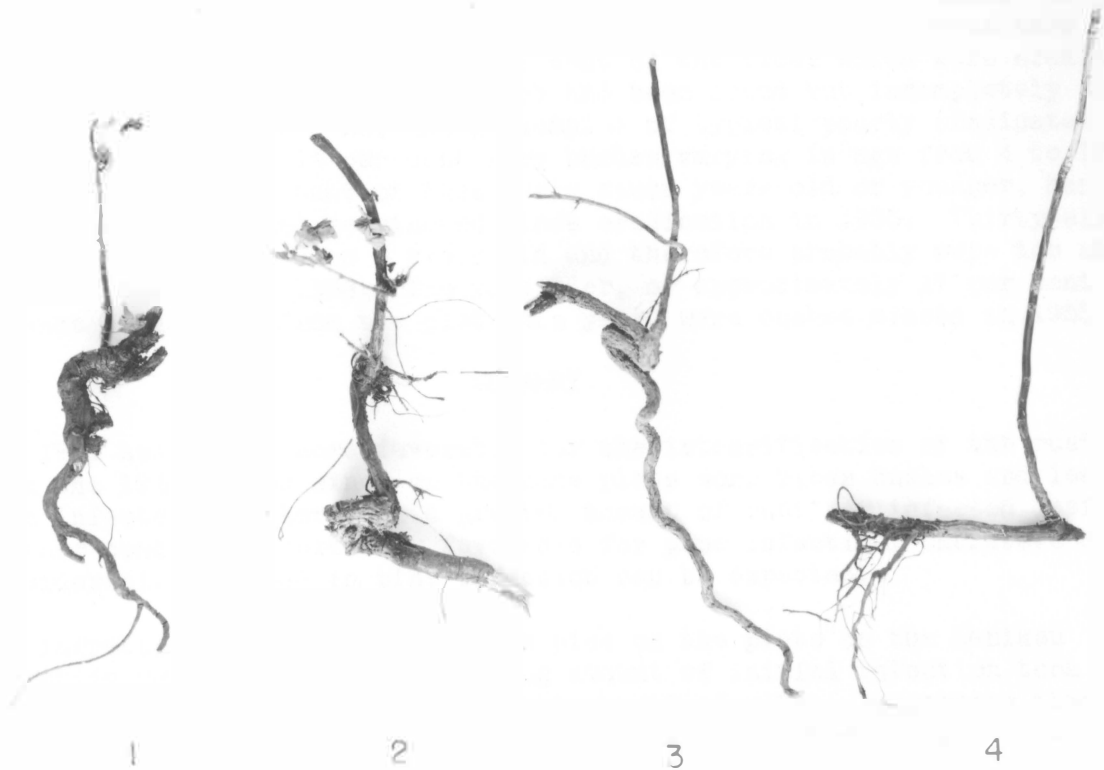
1. Although only 36.6 per cent of the bushes were eradicated, approximately three-fourths of the live stem and leaves, two-thirds of the infected leaves, and 61.4 per cent of the infection were removed.
2. The ribes were reduced from 704 to 448 per acre or 36.6 per cent and the live stem from 1,232 to 343 feet per acre or 73 per cent.
3. The square inches of infection per foot of live stem are much greater on bushes in the 0-12 inch live stem class than in any of the other classes, but the amount of infection per bush increases with the increase in size classes.
4. The average increase in growth from 1940 to 1941 was 3.53 inches per foot of live stem or 29 per cent.
5. The dead stem data are cumulative in that they represent all dead stem found intact in 1941 which has accumulated during the life of the ribes population. In other words, approximately 20 per cent of all live stem produced by 1941 had died. Since this dead stem was all removed in 1941 succeeding inspections will give a better idea of the relation between the development of new growth and the death of old stem. Comparing the percentages for dead stem and live stem increases suggests that the live stem is increasing about nine per cent per year.

TABLE 5

SUMMARY OF DATA FOR ALL RIBES LACUSTRE BY LIVE STEM CLASSES
EAST EMERALD CREEK PLOT 21, ST. JOE OPERATION, 1941

	Ribes Classes by Inches of Live Stem													
	0-6		7-12		13-18		19-24		25-36		37-48		49-60	
	Total	Erad.	Total	Erad.	Total	Erad.	Total	Erad.	Total	Erad.	Total	Erad.	Total	Erad.
No. Ribes	265	11	303	4	186	55	101	77	116	110	61	60	29	29
No. Inf. Ribes	223	2	285	3	177	53	98	76	112	106	60	59	29	29
Ft. L. S.	92.8	1.6	236.3	2.7	238.6	72.9	177.3	136.7	289.4	274.7	214.00	210.6	129.8	129.8
Ft. Growth 1941	20.5	.1	42.9	.2	42.0	11.6	37.5	29.1	61.4	58.3	49.9	49.3	32.7	32.7
In. Growth 1941														
Per Ft. L. S.	3.40		2.66		2.56		3.22		3.23		3.65		4.03	
Dead Stem	37.0	37.0	53.8	53.8	45.3	45.3	49.3	49.3	103.6	103.6	52.6	52.6	24.1	24.1
No. Leaves	1,413	12	2,795	23	2,505	740	2,057	1,634	3,747	3,565	2,746	2,698	1,634	1,634
No. Inf. Leaves	816	4	1,598	16	1,319	430	1,029	838	1,693	1,608	1,139	1,136	789	789
Tot. Inf., Sq. In.	69.17	.12	111.01	1.28	90.79	32.75	68.53	55.17	102.78	96.36	63.62	63.59	44.99	44.99
Sq. In. Inf.														
Per Ft. L. S.	.75		.47		.38		.39		.36		.30		.35	
Sq. In. Inf.														
Per Bush	.26		.37		.49		.68		.89		1.04		1.55	

	Ribes Classes by Inches of Live Stem										Grand Total	Eradicated	
	61-72		73-84		85-96		97-108		109-plus			Number	Per Cent
	Total	Erad.	Total	Erad.	Total	Erad.	Total	Erad.	Total	Erad.			
No. Ribes	17	17	10	10	7	7	7	7	25	25	1,127	412	36.6
No. Inf. Ribes	17	17	10	10	7	7	7	7	25	25	1,050	394	37.5
Ft. L. S.	92.9	92.9	63.7	63.7	51.7	51.7	60.8	60.8	371.8	371.8	2,019.1	1,469.9	72.8
Ft. Growth 1941	20.2	20.2	12.5	12.5	9.3	9.3	13.0	13.0	117.5	117.5	459.4	353.8	77.0
In. Growth 1941													
Per Ft. L. S.	3.33		2.93		2.62		3.27		5.43		3.53		
Dead Stem	30.1	30.1	12.0	12.0	13.2	13.2	21.8	21.8	51.1	51.1	493.9	493.9	100.0
No. Leaves	1,096	1,096	1,022	1,022	719	719	885	885	6,131	6,131	26,750	20,159	75.4
No. Inf. Leaves	446	446	170	170	154	154	282	282	1,277	1,277	10,712	7,150	66.3
Tot. Inf., Sq. In.	26.96	26.96	4.96	4.96	6.28	6.28	8.46	8.46	60.25	60.25	657.80	404.17	61.4
Sq. In. Inf.													
Per Ft. L. S.	.29		.08		.12		.14		.16		.33		
Sq. In. Inf.													
Per Bush	1.59		.50		.90		1.21		2.41		.58		



W 234. Approximately one-half natural size. Types of regenerated Ribes lacustre roots eradicated in 1941 from East Emerald Creek plot 21. The peculiar curved crowns of 1, 2 and 3 show how the tops may be broken off if leverage is applied at the stem tips. No. 4 is a three-inch stem which regenerated either due to rooting before the ends were broken or covering during eradication. Bush details are as follows: No. 1, 3 inches high, 3 inches live stem, 6 years old; No. 2, 13 inches high, 15 inches live stem, 7 years old; No. 3, 8 inches high, 20 inches live stem, 7 years old; No. 4, 13 inches high, 22 inches live stem, 7 years old.

Since the general area in which the plot is located had been searched for ribes by eradication crews in 1935, an examination was made of all bushes pulled this year in order to determine the reason for so many ribes. As a result of this examination of 412 R. lacustre, 15 per cent were found to be regenerations from layered stems and 41 per cent from broken crowns. It is also worthy of note that not a single one of the regenerated bushes came from a broken root. In other words, 56 per cent of the ribes which were eradicated from the plot in 1941 were bushes which had been found but incompletely eradicated in 1935. Picture W 234 shows examples of typical poorly eradicated bushes. The remaining 44 per cent were bushes varying in age from 4 to 15 years. Twenty-six per cent of these were seven years old or younger, hence were from seed which had germinated since eradication in 1935. Thirty-six per cent of these were 7 to 8 years old and therefore probably were too small to be found readily in 1935. The remainder, or approximately 17 per cent of all bushes eradicated from the plot this year, were bushes missed in 1935.

SUMMARY

1. The 1941 season was more favorable for the intensification of the rust than the 1940 season since on the same plots more ribes bushes and leaves were infected and there was a greater amount of rust per infected leaf. Weather conditions were very favorable for pine infection, therefore a considerable increase in pine infection can be expected.
2. The inspection of the planted white pine on the plots on the Kaniksu operation revealed that a surprising amount of initial infection took place in 1937 from a relatively small amount of ribes, suggesting that very thorough eradication of ribes must be accomplished if protection is to be obtained.
3. The data for small bushes indicated that they are an important factor in the development of the rust on ribes. Consequently it may be necessary to remove them quite thoroughly in order to maintain protection of the white pine from blister rust.
4. The eradication of R. lacustre is a very difficult problem because of the ease with which the crown may be partly broken off and left to regenerate. No regeneration from roots was found, suggesting that if the crowns of R. lacustre are thoroughly removed the species will not regenerate from the roots.

DEVELOPMENTAL WORK IN METHODS OF RIBES ERADICATION AND PROGRESS OF RIBES ECOLOGY WORK IN THE NORTHWESTERN REGION FOR 1941

By

V. D. Moss, Assistant Forest Ecologist
and H. R. Offord, Pathologist

INTRODUCTION

The activities of the methods project in the Northwestern Region for 1941 included studies with hand methods of ribes eradication, checking of ribes ecology plots, the derivation and testing of a ribes regeneration key, and laboratory and greenhouse work at Berkeley.

The developmental work in hand methods of ribes eradication consisted in the preparation of a working plan, the selection and establishment of the experimental areas and the performance of field trials to determine the maximum production and efficiency for size of crews, width of crew strips, and methods of laying string lines. Two 160-acre experiments were conducted. One was located on the St. Joe operation in open reproduction and the other on the Clearwater Forest in cutover type. The one, two, and three-man crews were employed in the studies, working intervals of 6, 12, and 24 feet per man. Half the area was prestrung and on the remainder the crews laid their own string lines. Data obtained from these studies will be statistically examined and the results of the analysis will be presented as a special report. A preliminary report is given herein on the methods and procedures involved in the execution of the field studies.

The ecological work presented in this report deals with three grazing studies. These were inaugurated to determine the effects of sheep on the germination, growth, and development of ribes and western white pine in relation to ribes eradication work and the ultimate protection of white pine reproduction on cutover land. In addition, a report is given dealing with the germination and growth of the two major species of upland ribes, *Ribes lacustre* and *R. viscosissimum*, and western white pine on duff, mineral and burned-mineral soil surfaces, each under full sun, half shade and full shade conditions. A description of the ribes regeneration key is withheld from this report until further study can be made of the preliminary key developed during the latter part of the 1941 field season.

A list of the papers prepared in connection with laboratory and greenhouse work done at Berkeley during the winter of 1940-1941 is given in this report. A section has also been prepared on the status of recommendations on special methods of ribes eradication and new developments of 1941.

A Study to Determine the Relation Between Size of Crew, Width of Crew Strip and Method of Laying String Line to Obtain Maximum Production and Efficiency on Ribes Eradication

Size of crew, width of crew strip and method of laying string lines in advance or by the crews have been intricate problems since the inception of ribes eradication work in the Northwestern Region. Such factors as the change in status of control work, refinement of control standards, variation in methods,

labor and tools for ribes removal have materially influenced both the application of results from previous methods studies and the opinions formulated from practical field experiences. The present study was undertaken to help achieve the important objectives of maximum production and efficiency in ribes eradication under clearly defined field conditions.

Two 160-acre tracts were selected for the eradication studies. One was located on the Clearwater operation on cutover lands and the other on the St. Joe Forest in open reproduction. The general plan followed in the establishment of the working units was first to divide the 160-acre tracts into quarters and to select alternate quarters totaling 80 acres for each method of laying string line. Each quarter (40 acres) was then divided into nine blocks. The dimensions of each block were 144 feet by 1320 feet (20 chains). The first three blocks were assigned to the one, two and three-man crews working at an interval of six feet per man. The same crew formations, in the order above named, worked the next three blocks at an interval of 12 feet per man. The last three blocks in each quarter were worked at an interval of 24 feet per man. The nine blocks in each quarter thus represented the work of a one, two and three-man crew working a 6, 12 and 24-foot interval per man.

In order to facilitate the recording of data for each of the methods tested, each block was divided into eight plots. The plots comprised an area 144 feet by 165 feet ($2\frac{1}{2}$ chains). The $2\frac{1}{2}$ -chain boundaries were used as count lines to record the minutes of working time and the numbers of ribes pulled and missed by the eradication crews. Information was obtained for each crew tested on the basis of subplots, which differed from the plots only in regard to the widths. The subplots for each formation represented the maximum interval assigned to the crew. These were 24 feet wide for the one-man crew, 48 feet wide for the two-man crew and 72 feet wide for the three-man crew.

To mark the lateral count lines and all working divisions down to subplots, string lines were pre-laid. The subplot string lines were used as guide lines for the start of a crew strip in each subplot. A regular crew formation was used for prestringing half of the 160-acre tract in advance.

Some exceptions to the general plan outlined for the establishment of the experimental areas were carried out for the study conducted on the St. Joe operation. It became necessary to select two comparable areas for the total required acreage in order to obtain conditions representative of typical open reproduction type. Working units for both were established in conformity with a plan of systematically distributing the crew formations over the area in such a manner as to secure a similarity of working conditions.

In the selection of crewmen for these studies, men of average caliber were obtained from adjacent blister rust camps. Twelve men were selected out of a cooperative camp for the Clearwater experiment. Six men were used on the St. Joe plots, three from a Forest Service regular and three from a cooperative camp. The same men were used throughout the study except for an occasional replacement necessitated by sickness or some other cause. When a man was excused from the job an alternate of equal caliber was used until the regular worker returned. Each man worked as a one-man crew and in the

two-man and the three-man formations for each method of laying string line.

The eradication tests were started by assigning six men to block 1, which contained six subplots each 24 feet wide. Each man worked four 6-foot strips which completed a subplot. As soon as block 1 was finished the six men were grouped into three two-man crews to work block 2. For block 3 the same six men were grouped into two 3-man crews. This procedure of changing crew sizes and crew widths continued until all nine blocks had been worked in the first quarter representing 40 acres.

Direct supervision was furnished to the crews by assigning an assistant camp boss or a man of equal ability to each six crewmen. In addition to the task of supervision, he recorded all data required. No missed ribs were pulled behind, as is the practice for the regular field operations. By this procedure it was possible to secure comparable data on the efficiency of crews.

No mop-up work in its true application was undertaken. Instead, a 50 per cent check was performed by a qualified checker. Successive strips, each 12 feet in width, were run through each subplot until half the subplot had been examined for missed ribs. The number of missed bushes was recorded by species and amount of live stem.

Because of the extensive work needed for adequate analysis of the raw field data, no conclusions in regard to the tests on size of crew, width of strip and method of laying string line are given in this report. Instead, data will be systematically grouped by ribs population classes and all relations expressed from regressions based on total ribs per acre. This will enable a comparison to be made for man-days of working time per acre and ribs per man-day between the various methods examined. The efficiencies of the various formations will be examined by the use of the analysis of variance and covariance. A special detailed report covering this work will be made upon completion of the statistical analysis.

Status of Recommendations on Special Methods of Ribs Eradication and New Developments of 1941

Recommendations. Except as noted, reference should be made to the 1939 and 1940 annual reports for detailed recommendations on the following methods and equipment:

1. Light or medium weight claw mattock.
2. Use of dynamite for blasting troublesome ribs.
3. Broadcast spraying with Atlacide (*R. petiolare*) or Diesel oil (*R. roezli* seedlings).
4. Diesel oil for decapitated ribs in rocky locations.
5. Dry chemical for treatment of decapitated ribs. Use the new formula of one part by weight of dry, fine crystal common salt and one part by weight of dry powdered borax technical.
6. Bulldozer methods for brush removal in stream type.
7. D-2 Caterpillar tractor equipped with front end brush rake and rear end power hooks. Install steel rollers on rear end drum to guide and prevent undue wear of the cable.

Developments of 1941. An important new development of 1941 has been the testing of a ribes regeneration key in both the Northwestern and the Sugar Pine Regions. The purpose of this key is to facilitate the evaluation and interpretation of all ecologic data for any given area of ground to the end of predicting what the future regeneration of ribes on that area will be and at the same time to aid in establishing correct eradication plans for the immediate suppression of those ribes. Although the key is still in its developmental stage, preliminary tests were encouraging and further work should improve its usefulness and accuracy.

The operation of the hooks from the rear end of the D-2 tractor was improved by installing in a vertical position on the drum a pair of 12-inch steel rollers. This installation made it easier to roll out the cable by hand, and reduced friction and wear on it when the hooks were being pulled at an angle to the revolving cable drum.

An improved ribes peavy was designed and tested in the field with excellent results. A ribes tongs and hydraulically operated bar for lifting large deeply rooted ribes was designed by J. F. Breakey and tested under field conditions in Idaho and California. Special interest was attached to the design of the ribes tongs with the thought that they might be adapted to power equipment. It is unlikely that this type of apparatus will be useful to one or two-man crews, unless operated by power.

Repetition of cross and self-pollination tests on R. roezli confirmed previous data showing that this species normally sets fruits in nature by cross-pollination.

Encouraging progress has been made in Idaho and California in ribes ecology work. The results of this work, as described by V. D. Moss (Northwestern Region) and C. R. Quick (Sugar Pine Region) relate to the germinative responses of white pine and ribes to the effects of grazing on ribes regeneration and to general relationships of ribes ecology and white pine and sugar pine silviculture.

Laboratory and Greenhouse Work During 1941.

At Berkeley, full use was made of laboratory and greenhouse facilities during the winter of 1940-1941 to carry on the following: (a) routine care of the Ribes Garden and greenhouse; (b) chemical and physical examination of many soil samples taken from field plots and study areas in California, Oregon and Idaho; (c) tests on the viability, longevity and general germinative response of ribes seeds. The following special reports were completed and distributed during 1941. The practical significance of the data in these is noted for each:

Serial No. 108. Methods Studies of the Tagging of Ribes Before Eradication, Virgil D. Moss.

In regard to rapidity of work by regular and prestringing methods slight but non-significant differences favored the regular method. Efficiency (i.e., number of plants remaining after the first working) was significantly better

for the regular method in areas of high ribes population and closely approached significance for low populations.

Serial No. 109. A Key to the Ribes of California, Clarence R. Quick.

Forty-three species and varieties of ribes are listed and described so as to facilitate their identification.

Serial No. 110. An Approximate Index of Habitat, Clarence R. Quick.

The proposed scheme and formula may be useful in correlating known sites of serious ribes regeneration, or insistent rust development with sites of similar potentialities.

Serial No. 111. Experimental Germination of Ribes Seed. Series of 1940. Clarence R. Quick.

These tests represent 1,543 separate cultures of ribes seeds totaling 99,670 seeds and cover 14 topics as related to germinative response of the seeds. Viability tests on old seeds collected from herbarium sheets show that several ribes species can retain viability under these conditions for 17 years.

Serial No. 112. Manual for Care of Ribes Ecology Plots, Sugar Pine Region, Clarence R. Quick.

Outlines schedules to be followed in care and in data taking for all field plots and includes location data and general objectives.

Serial No. 113. Self-Sterility in Several Ribes Species of Western United States, H. R. Offord, C. R. Quick and V. D. Moss.

Controlled cross and self-pollination of R. roezli, R. nevadense and R. viscosissimum showed that these ribes normally set seed-bearing fruits only after cross-pollination. Eradicative effort in connection with the blister rust control should be aided by this natural phenomena once the number of flowering ribes per acre has been substantially reduced. The small fruit crop of scattered ribes and rodent attacks on this diminishing supply will aid the natural suppression of ribes which normally takes place in ecologically maturing forest stands.

Field Study of the Relative Merits of Regular Stringing and Prestringing for Ribes Eradication Work in California, December 9, 1941, L. P. Winslow.

Analysis of field data for regular stringing and prestringing in California showed that there is no obvious advantage in saving of time or efficiency of work from either method for the field conditions under which the study was made. The choice between regular or prestringing should be left to the judgment of the responsible field supervisor.

The Effects of Variable Light and Moisture Conditions on the Germination, Growth and Development of *R. viscosissimum*, *R. lacustre* and *Pinus monticola*

The purpose of this study is to secure information on the germination, survival and growth requirements of the two major species of ribes and of western white pine under full sun, half shade and full shade conditions. At each of these light stations ribes seed was sown at the rate of 800 per square foot and western white pine at the rate of 100 per square foot on undisturbed natural duff, on mineral, and on burned-mineral soil surfaces. The plot surfaces were prepared and rodent and bird proof fences constructed during the late summer and early fall of 1940. The seed was sown in late October of the same year. The initial phases of this project are described on pages 122 to 126 of the 1940 annual report.

Seedling counts were inaugurated May 6, 1941, and continued throughout the season at ten-day intervals. Each time the plots were examined all new seedlings which had become visible during the ten-day period were staked with colored toothpicks. Different colored toothpicks were used, each color representing the date of an examination. In the end this gave the number of seedlings appearing and surviving by ten-day intervals during the first season.

The mortality of seedlings was classified as having resulted from physical injury, insects, damping-off fungi, heat and drought. Physical injury is defined as failure of the seedling root or radicle to become firmly established in the soil. Much mortality resulted from this cause because all seed was sown directly on the soil surface. During each plot examination, all dead seedlings were removed, classified as to cause of death and recorded by the color of toothpick or date of appearance. By this procedure mortality can be correlated with the date of seedling emergence.

During the season, vertical root penetration and aerial development of seedlings were observed at monthly intervals. Root measurements were obtained by carefully removing the soil from around the roots of seedlings in the sown strips located at one end of the seedbeds. Within the seedbeds, morphological studies of aerial parts such as stem heights, number of leaves, etc., were made by selecting at random 10 seedlings in each subplot. At the end of the growing season and before defoliation had commenced, groups of seedlings were removed from the root-study strips and weights for their aerial and root portions were determined.

Surface soil temperatures were recorded daily during the period of optimum seed germination and heaviest seedling losses. The remainder of the time, these surface temperatures were recorded from three to five days while periodically examining the seedbeds. The 6-inch and 12-inch soil temperature readings were obtained at the time examinations were made for seedling germination and mortality. Soil samples, secured with the aid of a soil auger, were taken at 10-day intervals for moisture determinations of the surface, 6-inch and 12-inch zones. At the end of the season, soil samples from these three zones were sent to the Berkeley laboratory for hydrogen-ion determinations.

Some results of the first seasons study are shown in tables 1, 2 and 3. Table 1 gives the number of seedlings appearing between the dates of examinations. Table 2 shows the number of seedlings lost from the different causes (of mortality) for soil surfaces at the three light stations. Table 3 summarizes data which show the per cent (of total seed sown) germinating, the per cent (of total seedlings germinating) surviving, the per cent green weight of seedling tops over roots, and the actual gram green weight of seedling tops plus roots.

TABLE 1

OCCURRENCE OF RIBES AND WHITE PINE SEEDLINGS AT 10-DAY INTERVALS
ON DUFF, MINERAL AND BURNED-MINERAL SOIL SURFACES AT THE
FULL SUN, HALF SHADE AND FULL SHADE LIGHT STATIONS

Date Checked	Duff Surface			Mineral Surface			Burned- Mineral Surface		
	R. lac.	R. vis.	P. mont.	R. lac.	R. vis.	P. mont.	R. lac.	R. vis.	P. mont.
Full Sun Light Station									
May 6	9	11	5	933	326	335	408	114	56
May 16	1	2	2	638	260	267	261	31	67
May 26	2	3	4	634	460	155	507	265	86
June 5	1	0	2	392	172	71	364	177	83
June 15	2	0	7	406	68	44	297	69	15
June 25	0	0	0	83	27	6	67	16	7
July 5	0	0	0	93	9	3	62	18	0
7/15-9/13	0	0	0	5	0	2	0	0	0
Totals	15	16	20	3,184	1,322	883	1,966	740	314
Half Shade Light Station									
May 6	23	43	3	1,402	289	192	1,320	817	599
May 16	5	5	6	499	251	444	333	164	290
May 26	5	2	18	349	355	316	384	306	175
June 5	2	1	8	141	124	145	172	141	74
June 15	4	1	11	117	61	61	192	101	54
June 25	0	1	2	60	11	8	62	16	5
July 5	3	1	0	97	0	3	140	7	3
7/15-9/13	0	0	1	60	1	1	47	4	0
Totals	42	54	49	2,725	1,092	1,170	2,650	1,556	1,200
Full Shade Light Station									
May 6	149	168	51	812	268	221	1,504	424	384
May 16	228	50	137	687	335	424	403	495	344
May 26	219	36	258	260	325	357	284	413	281
June 5	98	11	211	79	78	226	96	105	231
June 15	69	16	163	55	53	171	69	88	119
June 25	5	7	15	15	16	16	19	21	13
July 5	3	0	6	20	6	9	14	8	7
7/15-9/13	0	0	0	9	2	0	44	0	2
Totals	771	288	841	1,937	1,083	1,434	2,233	1,554	1,379

Table 1 shows that on all soil surfaces and at all three light stations the majority of both the ribes and the white pine seed had germinated by June 15. The seed of R. lacustre was found to have germinated in greater abundance throughout the seedbeds at the three light stations than did seed of R. viscosissimum. In general, a larger amount of the total seed planted was found to have germinated for white pine than for either species of ribes. The duff surface was found to be the least favorable for the germination of all seed, and the mineral surface the most favorable. The germination of ribes and white pine seed was found to increase toward full shade conditions on the duff surface. On the mineral surface, the amount of seed germinating for R. lacustre and R. viscosissimum was found to decrease toward full shade conditions, whereas the amount of germination of white pine seed increased toward the same conditions. On the burned-mineral soil surface, the number of seed germinating for both ribes and white pine was the least at the full sun station and of about equal numbers at the half shade and full shade stations.

TABLE 2

OCCURRENCE AND CAUSE OF RIBES AND WHITE PINE SEEDLING MORTALITY THE FIRST SEASON FOLLOWING GERMINATION ON DUFF, MINERAL AND BURNED-MINERAL SOIL SURFACES AT THE FULL SUN, HALF SHADE AND FULL SHADE LIGHT STATIONS

Degree Light	Cause of Mortality	Ribes lacustre				Ribes viscosissimum				Pinus monticola			
		Type of Surface				Type of Surface				Type of Surface			
		Duff	Min- eral	Burned Mineral	Total	Duff	Min- eral	Burned Mineral	To- tal	Duff	Min- eral	Burned Mineral	To- tal
Full Sun	Physical		79	121	200	3	77	24	104	2	254	86	342
	Insect		4	2	6		1		1		53	13	66
	Damping-off						17		17				
	Heat	6	623	680	1,309		139	75	214	4	13	8	25
	Drought												
Half Shade	Physical	4	51	26	81	7	41	35	83	7	51	140	198
	Insect						1		1	2	12	17	31
	Damping-off						30	57	87		1	2	3
	Heat	6	24	89	119	3	11	31	45	3	7	21	31
	Drought			17	17			1	1				
Full Shade	Physical	25	167	78	270	11	133	54	198	59	84	107	250
	Insect					1			1	4	14	6	24
	Damping-off	7	36	15	58	1	29	126	156	75	157	192	424
	Heat												
	Drought	52	1		53	28	1		29	37			57

Commencing with the first examination, seed germination was considered complete upon the appearance of the radicle. The radicle or root of a large number failed to become oriented and established in the soil, which resulted in their early death. Mortality resulting from this cause was classified as physical and was especially heavy on soil surfaces which tended to dry early in the season. The remaining four types of mortality were used to designate loss of seedlings after they had become established and when the cotyledons became visible.

Insects were found to inflict a greater loss to white pine than to ribes seedlings. Damage resulting from this cause was due chiefly to cutworms and adult beetles. Loss from damping-off organisms increased as the canopy closed and tended toward full shade. The organisms attacking both pine and ribes seedlings have not all been identified, although preliminary work has shown that *Cylindrosporium ribis* Davis probably was the fungus causing a heavy loss of ribes. There still remains some question in regard to the con-specificity of this species with *Septoria sibirica* Thuemen. The identification of the various organisms collected from the seedbeds is being made by Dr. John Ehrlich, Associate Professor of Pathology at the University of Idaho.

Loss from heat was found to be most severe at the full sun station. Mortality from this cause was identified by conspicuous heat lesions on the stems of both ribes and white pine seedlings. On the other hand, loss from drought occurred almost entirely at the full shade station. Drought kill was identified by the shrinkage and drying of seedlings without the presence of lesions or damping-off organisms. In general, it was found that the mortality of seedlings from physical causes occurred early in the season; that losses from insects continued throughout the season; that losses from damping-off organisms occurred in late spring and early summer, and that losses from heat and drought occurred during the latter part of July and throughout August.

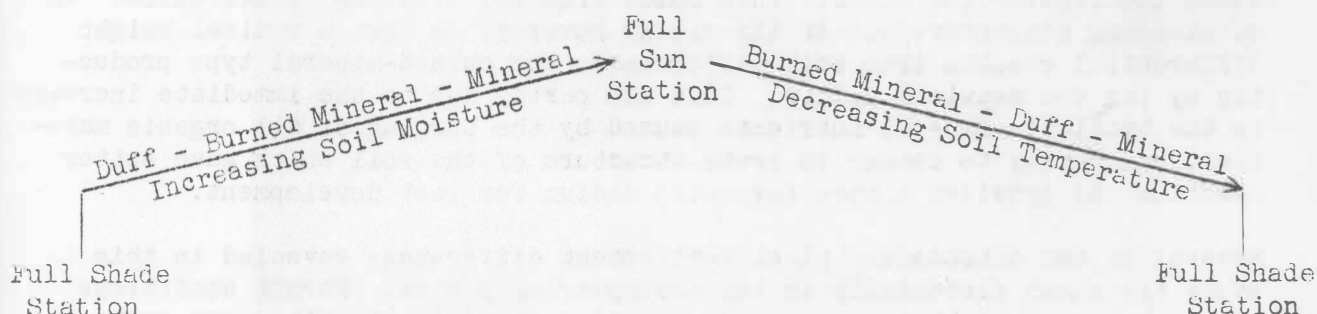
TABLE 3

SUMMARY OF SOME FIRST SEASONS COMPARISONS SHOWING PER CENT
OF SEED GERMINATING, PER CENT OF SEEDLINGS SURVIVING
AND SEEDLING WEIGHTS AS A MEASURE OF GROWTH

Degree of Light	Ribes lacustre			Ribes viscosissimum			Pinus monticola		
	Type of Soil Surface, Each Sown With			Type of Soil Surface, Each Sown With			Type of Soil Surface, Each Sown With		
	16,000 Seed			16,000 Seed			2,000 Seed		
	Duff	Mineral	Burned Mineral	Duff	Mineral	Burned Mineral	Duff	Mineral	Burned Mineral
Per Cent of Total Sown Seed Germinating									
Full Sun	.1	19.9	12.3	.1	8.3	4.6	1.0	44.2	15.7
Half Shade	.3	17.0	16.6	.3	6.8	9.7	2.5	58.5	60.0
Full Shade	4.8	12.1	14.0	1.8	6.8	9.7	42.1	71.7	69.0
Per Cent of Total Seedlings Surviving									
Full Sun	60.0	77.8	59.2	81.3	82.3	86.6	70.0	63.8	65.9
Half Shade	76.2	97.2	95.0	81.5	92.4	92.0	75.5	93.9	85.0
Full Shade	99.1	89.5	95.8	85.8	84.9	88.4	79.2	82.2	77.9
Ratio of Per Cent Seedling Weight in Tops to Per Cent in Roots (Average 50 Plants)									
Full Sun		<u>67</u> 33	<u>71</u> 29		<u>74</u> 26	<u>77</u> 23		<u>40</u> 60	<u>41</u> 59
Half Shade		<u>74</u> 26	<u>79</u> 21		<u>78</u> 22	<u>81</u> 19		<u>49</u> 51	<u>47</u> 53
Full Shade	<u>77</u> 23	<u>81</u> 19	<u>85</u> 15	<u>79</u> 21	<u>83</u> 17	<u>89</u> 11	<u>55</u> 45	<u>57</u> 43	<u>58</u> 42
Total Green Weight Per Seedling in Grams (Average 50 Plants)									
Full Sun		.29	2.84		1.28	5.29		.67	.79
Half Shade		.18	1.70		.57	4.68		.39	.43
Full Shade	.13	.05	.10	.33	.10	.21	.11	.09	.07

A brief digest of the more important results obtained from the first years study of the plots is presented in table 3. All information has been included except soil moisture and soil temperature readings. These are withheld because complete seasonal readings cannot be obtained until the plot values are correlated with climatological data taken at the Bismark Ranger Station and at the Priest River Experiment Station. A diagrammatic chart follows which gives the general seasonal trends for soil moisture and soil temperature. This chart represents the conditions found existing at each of the light stations for moisture and temperature at the soil surface. References to soil moisture and soil temperature in relation to seed germination and survival will be based on the chart showing general seasonal trends and not upon daily readings.

DIAGRAMMATIC CHART SHOWING GENERAL SEASONAL TRENDS FOR
SOIL MOISTURE AND SOIL TEMPERATURE AT THE
THREE LIGHT STATIONS



The percentage of ribes and white pine seed germinating is shown in table 3. These values represent the per cent of total sown seed that germinated on each plot. It is interesting to note from these general trends that the percentage of ribes seed germinating on mineral soil increased toward full sun conditions, and conversely, the percentage of white pine seed germinating increased toward full shade conditions. The percentage of white pine seed germinating is also observed to increase toward full shade conditions on the duff and burned-mineral soils. These trends reveal that the germination of white pine seed increases toward a condition of heavier soil moisture and a lowering of soil temperature. On the other hand, it is observed that the percentage of ribes seed germinating increased toward a condition of decreasing soil moisture and a rising soil temperature. This fact is always true unless there exists an inadequate amount of soil moisture to promote germination. In such a case, the number of seed germinating will increase toward a condition of suitable soil moisture and a lowering of soil temperature. This trend is shown in table 3 for the germination of ribes and pine seed on the duff surface. It is also brought out by the diagrammatic soil moisture and soil temperature chart. The per cent of seed germinating is observed to increase from full sun to full shade conditions on this surface. The mineral surface in this study was found to have the nearest to optimum conditions for seed germination of the three soil surfaces represented.

The per cent of total seedlings surviving at the close of the first growing season was quite comparable for all species tested. Many seedlings of all species died from physical injury and from severe heat at the full sun station. In fact, mortality was found to be greatest at this station and least at the half shade station. At the latter, damping-off, physical injury and drought were the major causes of mortality. Loss from drought at this station occurred almost solely from shallow-rooted seedlings on the natural duff surface.

By weighing separately the tops and roots of 50 ribes seedlings it was found that under all conditions the tops are heaviest. Going from full sun to full shade conditions the volume in tops increased while that in roots decreased. This also holds true in all cases for the transition from duff, to mineral, to burned-mineral soil. Similar data for white pine seedlings show that tops

are lightest and roots heaviest for plants grown in full sun, while the opposite is true for those grown in full shade.

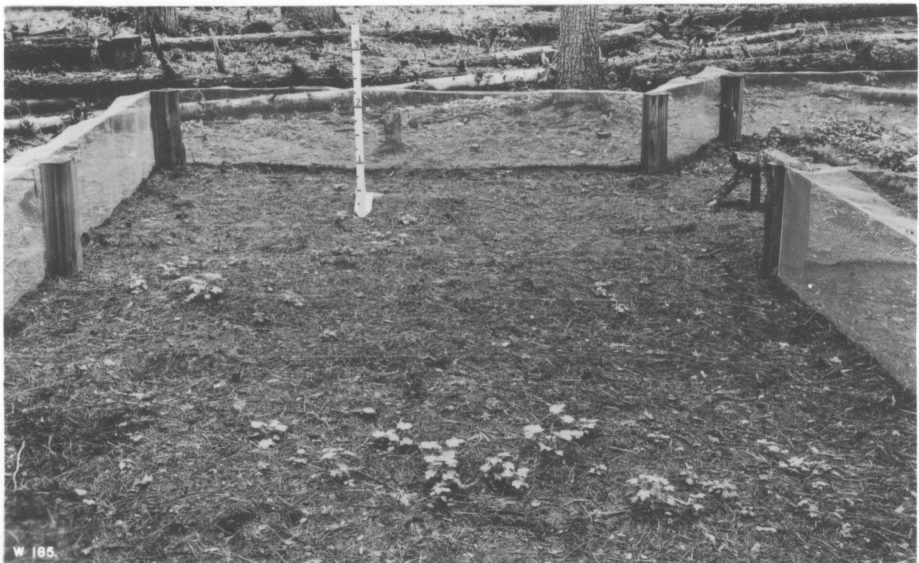
Comparing the total weights of seedlings it is evident that the greater the shade the lighter the plant. This holds true for ribes and pines alike. An outstanding characteristic of the ribes, however, is that a radical weight differential results from soil differences, the burned-mineral type producing by far the heaviest plants. This was partly due to the immediate increase in the available mineral nutrients caused by the burning of all organic material, and partly to change in crumb structure of the soil which gave better aeration and provided a more favorable medium for root development.

Several of the outstanding plant development differences revealed in this study are shown pictorially in the accompanying plates. Forest conditions surrounding the light stations and general seedbed construction are shown in Plate I. Germination and seasonal growth differences of seedlings on the various soils at each of the light stations are brought out in Plates II to IV. In photos W 180 and W 185, R. viscosissimum is the most noticeable species whereas in photo W 190 seedlings of all species can be observed in the separate subplot divisions. Plate III shows the extent of germination and the seasonal growth of all seedlings on the mineral soil surface at each of the three light stations. Plate IV shows the extent of germination and the seasonal growth of all seedlings on the burned-mineral soil surface at each of the three light stations. Of particular interest in the latter is the sturdy development of ribes shown in photo W 178, the tall and luxuriant growth shown in photo W 183 and the lack of good development in photo W 188. An interesting comparison can also be obtained by examining the different plates which represent germination and subsequent growth and development of seedlings during the first season on the three soil surfaces.

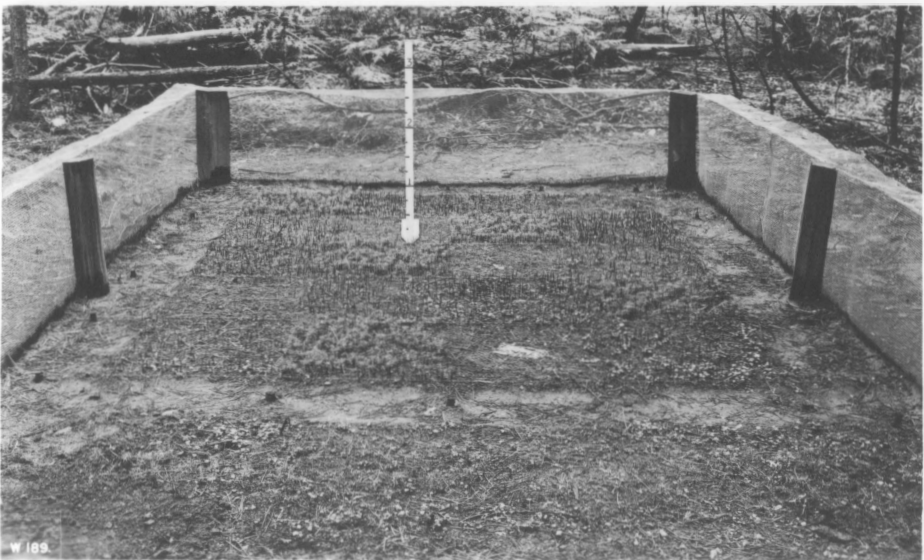
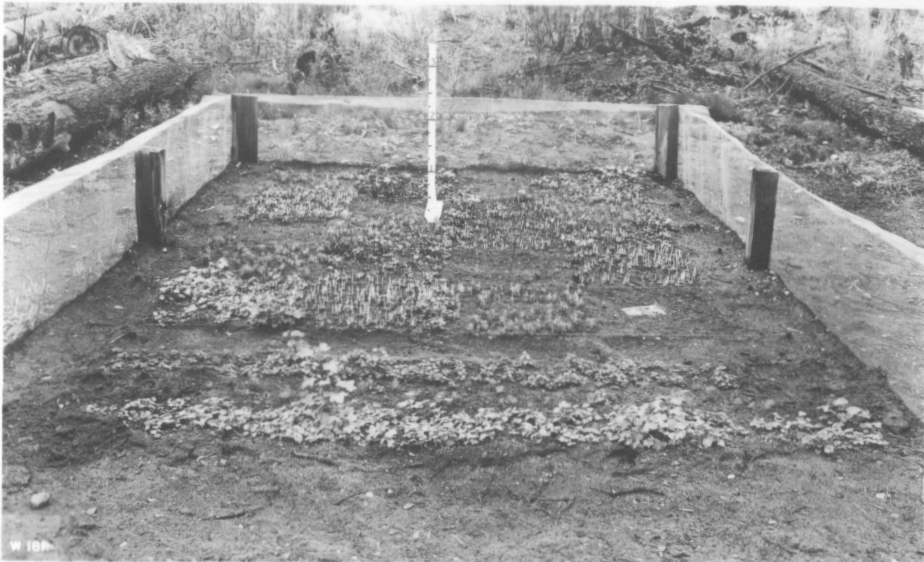
In Plate V, picture W 168 shows the seasonal development of seedling roots and aerial parts for the three species grown on a mineral soil medium. The lower picture, W 174, shows the development of the two species of ribes and western white pine grown on a burned-mineral surface. Seedlings shown in section A were obtained from the full sun station, seedlings of section B from a half shade station and seedlings of section C from full shade conditions. Seedling mounts with a numeral to the right of the specimen are identified as follows: (1) western white pine; (2) R. viscosissimum; (3) R. lacustre. The differences in the lengths of roots are particularly striking for seedlings from full sun toward full shade conditions. A noticeable difference can also be seen between height growth of seedlings grown on the burned-mineral medium and those grown under the same intensities of light but on a mineral stratum.



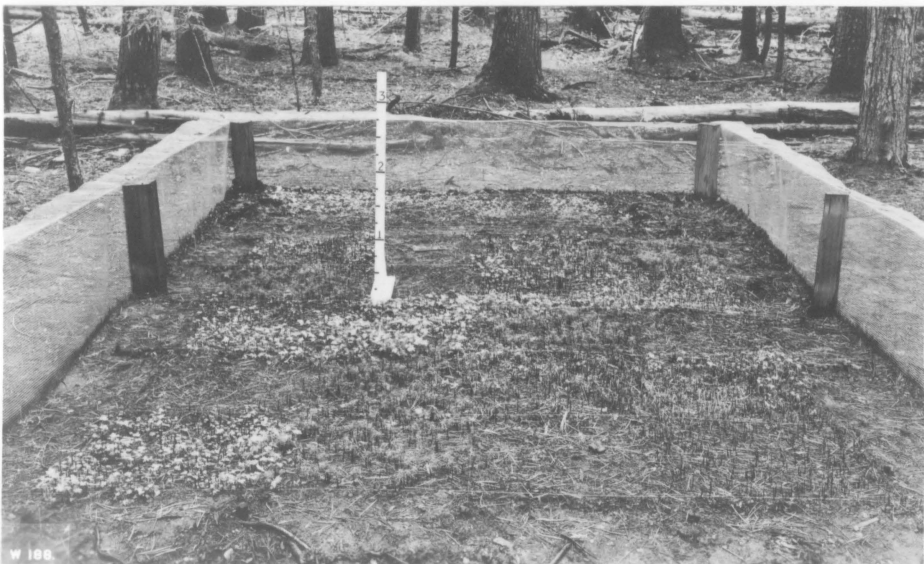
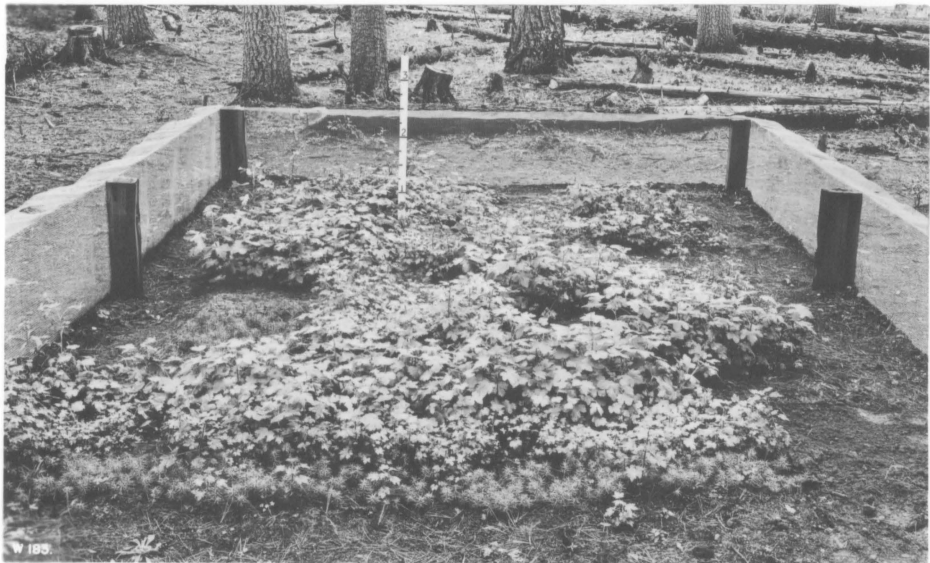
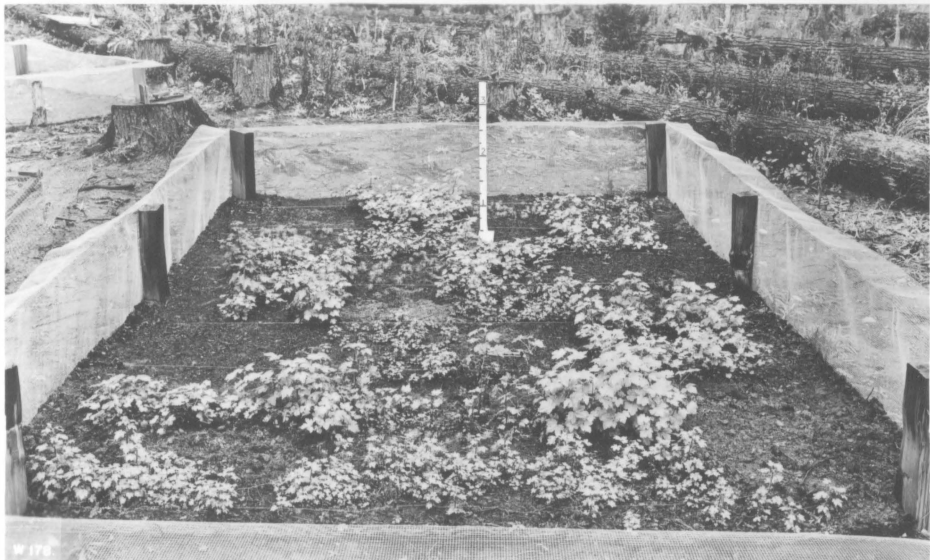
Forest conditions surrounding the rodent and birdproof seedbeds at the full sun (W 157), half shade (W 159) and full shade (W 163) stations.



Abundance and first seasons development of ribes and white pine seedlings germinating on natural duff surface. Full sun (W 180), half shade (W 185), full shade (W 190).



Abundance and first seasons development of ribes and white pine seedlings germinating on mineral soil surface. Full sun (W 181), half shade (W 186), full shade (W 189).



Abundance and first seasons development of ribes and white pine seedlings germinating on burned-mineral soil surface. Full sun (W 178), half shade (W 183), full shade (W 188).



Effects of seedling development at the end of the first growing season from mineral (W 168) and burned-mineral (W 174) soils. (A) Full sun, (B) Half shade, (C) Full shade. (1) Western white pine, (2) *Ribes viscosissimum*, (3) *E. lacustre*.

TABLE 4

pH MEASUREMENTS OF SOIL SAMPLES TAKEN FROM
LIGHT-MOISTURE PLOTS, LIGHT CONDITIONS
AND SOIL SURFACES AS SHOWN

Soil Zone	pH of Soil Sample					
	Duff Surface		Mineral Surface		Burned-Mineral Surface	
	1940	1941	1940	1941	1940	1941
Full Sun Station						
Surface	5.04	5.33	5.99	6.18	7.49	7.16
6 inch	5.57	5.84	5.67	6.01	5.59	6.26
12 inch	5.79	5.75	5.92	5.92	5.62	6.18
Half Shade Station						
Surface	5.29	5.27	5.79	5.84	7.22	6.95
6 inch	6.01	6.35	5.97	6.26	6.05	6.24
12 inch	5.90	6.01	5.72	5.93	5.92	5.96
Full Shade Station						
Surface	5.36	5.17	6.01	6.01	7.20	7.20
6 inch	5.92	5.90	5.88	6.01	5.58	5.82
12 inch	5.90	5.67	5.63	5.67	5.92	5.84

Hydrogen-ion determinations are shown for the three light stations by type and depth of soil surface in table 4. The three soil zones for the duff plots have exhibited little or no change from the original pH determinations. Exposing of mineral soil has reduced the acidity of nearly all soil zones at the three light stations. The strong alkalinity of the surface burned-mineral soil samples in 1940 has been greatly reduced at the full sun and half shade light stations. The acidity of the 6 and 12-inch zones has been reduced by the leaching of the alkaline deposits on the soil surface. Leaching of the alkaline deposit into the lower soil zones has been greatest at the full sun station with a decrease toward the full shade station. The latter has shown no appreciable change from the initial pH determinations. This is probably due to the insulation through shade against excessive temperature and moisture variation.

The Effect of Grazing by Sheep on the Germination, Growth and Development of Ribes and Western White Pine on Recently Cutover Areas.

This study is represented by five grazing exclosures, each one-tenth acre or more in size. Three of these are located on the Clearwater and two on the St. Joe forests. Two of the Clearwater exclosures were established in 1939, while the third on this forest and those on the St. Joe forest were started in 1940. Areas identified as exclosures are barricaded from sheep by the construction of a five to six strand barbed-wire fence.

Associated with each exclosure is a control plot of equal size which is grazed. Each control has been divided into halves with a half located on either side of the exclosure. This permits a wider distribution of sampling

for the intensity of grazing and approaches uniformity of conditions surrounding the enclosure.

Two major examinations are made of these plots with one check conducted prior to and the other following grazing. In addition, plots which are to be grazed during the fall months are checked in the spring of the same year, and plots grazed during the spring and early summer season are checked a third time during the early part of September. This is done in order to obtain an accurate history of seedling development.

Descriptions of plots and the results from 1939 and 1940 observations are to be found in annual reports for those years as follows: 1939, page 138; and 1940, pages 126 to 128.

The results of the 1941 field examinations showing white pine and ribes seedling occurrence and mortality are presented herein in tabular form. Morphological comparisons for ribes are given in the discussions accompanying each table.

TABLE 5

STATUS OF RIBES AND WHITE PINE SEEDLINGS IN 1941 AFTER THREE YEARS
FALL GRAZING (PLOT 1, EAST EXPOSURE, CLEARWATER FOREST)

Type of Plot	Status of Plant	Number Pines by Year of Origin						Number Ribes by Year of Origin					
		1937	1938	1939	1940	1941	Total	1937	1938	1939	1940	1941	Total
Exclosure (Ungrazed)	Alive	4	136	101	12	1	254	0	34	32	8	2	76
	Dead	0	8	6	0	0	14	0	1	6	1	0	8
Control (Grazed)	Alive	6	123	92	11	1	233	1	53	30	4	0	88
	Dead	0	5	1	0	1	7	1	4	1	0	0	6

The area represented by plot 1 was partially logged during 1937 and complete slash disposal measures were employed that fall by the piling and burning method. An examination of table 5 shows a large influx of both pine and ribes seedlings occurred the following spring, 1938, resulting from the initial disturbance of a 100 to 120-year-old virgin forest stand. The greater number of seedlings germinated by 1939, although a few continued to appear through 1941.

The area around plot 1 has been grazed about the 25th of September for the past three seasons. The degree of grazing has been measured as less than medium in intensity with practically all damage restricted to loss of terminal buds and leaves of the ribes. Fall sheepling of less than medium intensity has caused neither a noticeable increase nor decrease of the ribes and pine seedling population during the three year cropping of plot 1.

A somewhat different morphologic picture is presented for ribes on this area. For the 76 ribes bushes alive within the exclosure average measurements per bush are as follows: height, .74 feet; feet of live stem, 1.12; number of main stems, 1.13; number of laterals, 1.37; and number of leaves per bush,

15.11. For the 88 ribes alive on the control, average measurements per bush are as follows: height, 1.03; feet of live stem, 2.03; number of main stems, 1.17; number of laterals, 4.47; and number of leaves per bush, 25.16. The most striking difference between bushes browsed and not browsed is in the numbers of laterals and leaves per bush. This has resulted from the browsing in which continual cropping of terminal buds causes many new laterals to be born each spring on stems deprived of their terminal buds which in turn increases the numbers of leaves. No serious physical damage has resulted to the 233 live pine seedlings on the control, except slight main stem base scarring of a few.

The results of three seasons grazing on ground around plot 2 (a westerly exposed plot in the vicinity of plot 1) are shown in table 6. This western site has only about half the palatable plant population of the easterly exposure around plot 1. It is an area which sheep normally traverse quite rapidly, picking at a plant here and there but never stopping for any intensive degree of browsing.

TABLE 6

STATUS OF RIBES AND WHITE PINE SEEDLINGS IN 1941 AFTER THREE YEARS
FALL GRAZING (PLOT 2, WEST EXPOSURE, CLEARWATER FOREST)

Type of Plot	Status of Plant	Number Pine by Year of Origin						Number Ribes by Year of Origin					
		1937	1938	1939	1940	1941	Total	1937	1938	1939	1940	1941	Total
Exclosure (Ungrazed)	Alive	1	34	33	2	2	72	3	23	7	1	0	34
	Dead	0	0	1	0	0	1	0	4	2	0	0	6
Control (Grazed)	Alive	2	29	32	10	5	78	3	12	0	0	0	15
	Dead	0	2	1	0	0	3	1	1	0	0	0	2

Logging and slash disposal measures in the vicinity of plot 2 were similar to those employed in the area around plot 1. A larger proportion of mixed tree species was present and logged from this western exposure than on the eastern site. White pine seed trees are uniformly distributed throughout the entire area surrounding both plots, so that there is an adequate seed supply during a good cone year.

Table 6 shows that the germination of pine seed continued to establish about equal numbers of seedlings within the exclosure and on the control over a period of two years following the logging disturbance. Following this period, the decrease in numbers of new seedlings was more noticeable within the exclosure than on the control. If this difference can ultimately be proved significant, it is reasonable to suppose that the trampling by sheep has created more favorable seedbed conditions for the germination of pine seed by continual loosening of the forest floor mantle.

In regard to the germination of ribes, there was found to be one favorable year following logging with some continuation through 1940 within the exclosure. The results shown in table 6 might indicate that the continual loosening of the surface soil does not favor the establishment of new ribes seedlings

but other factors may enter here. Ribes vertical root development has been found to be much slower than that for white pine seedlings. On sites subjected to early summer drought, the loosening of the surface soil by tramping may be responsible for heavy loss by drought and furthermore may create unfavorable conditions for the germination of ribes seed. Such a conclusion cannot of course be considered valid until further studies have been made probably for a period of at least five years.

For the 34 ribes bushes alive within the enclosure average measurements per bush were found to be as follows: height, .77 feet; live stem, 1.32 feet; number of main stems, 1.28; number of laterals, 7.17; number of leaves per bush, 15.86. For the 15 bushes alive on the control average measurements are as follows: height, .84 feet; live stem, 1.56 feet; number of main stems, 1.00; number of laterals, 6.06; and 24.24 leaves per bush. Here again as observed for morphological comparisons of ribes on plot 1, a larger number of laterals and leaves per bush was recorded for ribes on the control than for bushes within the enclosure. Examinations revealed cropping of terminal buds by sheep was responsible for the greater number of laterals and leaves per bush.

The stand of timber partially removed in the vicinity of plot 3 is approximately the age of that surrounding the two former plots, but differs in that a few dominant trees, 160 years old or more, were present. The type of cutting and slash disposal methods employed around plot 3 was similar except for a few slash fires which were allowed to run broadcast. Practically all exposures are present, the larger portion of the area having northern and southern aspects. This area is grazed around the 15th of September or about 10 days earlier than plots 1 and 2. It receives about the same intensity of browsing, having been measured the last two years as receiving slightly less than a medium degree of trimming. The results of two seasons study are shown in table 7.

TABLE 7

STATUS OF RIBES AND WHITE PINE SEEDLINGS IN 1941 AFTER TWO YEARS
FALL GRAZING (PLOT 3, GENERAL ASPECT, CLEARWATER FOREST)

Type of Plot	Status of Plant	Number Pine by Year of Origin						Number Ribes by Year of Origin					
		1937	1938	1939	1940	1941	Total	1937	1938	1939	1940	1941	Total
Enclosure (Ungrazed)	Alive	16	434	406	39	4	899	3	36	45	2	3	89
	Dead	0	4	12	0	1	17	0	1	3	1	0	5
Control (Grazed)	Alive	23	329	87	14	5	458	4	146	35	4	4	193
	Dead	0	1	0	0	0	1	0	3	1	0	0	9

Of particular interest on plot 3 is the striking contrast between the numbers of pine and ribes seedlings within the enclosure and on the control. A few slash fires were allowed to run beyond the perimeter of the piles on the control with the result that limited portions of the forest floor mantle were consumed. This was responsible on a small part of a northern aspect for releasing a larger quantity of ribes seedlings as well as creating a more favorable condition for the germination of ribes seed. It is believed that

the intensity of this burn on the northern aspect of the control destroyed practically all the stored white pine seed, whereas the similar aspect within the exclosure was not subjected to the burn. Approximately 90 per cent of the seedlings of both pine and ribes were becoming established on the better and more favorable exposures. The extent to which trampling by sheep has affected further germination on the controls can not be determined from the results of study to date.

For the 89 ribes bushes alive within the exclosure average measurements per bush were found to be as follows: height, 1.04 feet; live stem, 2.19; number of main stems, 1.38; number of laterals, 3.91; and 23.39 leaves per bush. For the 193 alive bushes on the control average measurements per bush are as follows: height, 1.00 feet; live stem, 2.11; number of main stems, 1.33; number of laterals, 4.75; and 26.15 leaves per bush. With only two years grazing of approximately medium intensity, no significant morphological differences have occurred between ribes within the exclosure and those on the control.

Plots 4 and 5 on the St. Joe operation are located in a forest stand approximately 180 to 200 years old. This heavy mature to overmature white pine stand was intermixed with western hemlock, white fir, western red cedar and a small amount of western larch. All pine had been forced into the dominant and codominant classes, consequently when logged no seed trees were left on the area. The stand was removed during 1937, and the slash disposal measures applied the same fall were considered to be inadequate. Slash was loosely piled and many of the piles were not ignited.

White pine seedlings for restocking of this area must come largely from viable seed produced before the stand was logged, since no adjacent seed trees are present. Ribes seedlings will come from seed stored in the forest floor mantle during the early years in the development of the stand. The results of two years study on a north and south aspect are shown in tables 8 and 9.

TABLE 8

STATUS OF RIBES AND WHITE PINE SEEDLINGS IN 1941
AFTER TWO YEARS EARLY SUMMER GRAZING (PLOT 4,
NORTH EXPOSURE, ST. JOE FOREST)

Type of Plot	Status of Bush	Number Ribes by Year of Origin					
		1937	1938	1939	1940	1941	Total
Exclosure (Ungrazed)	Alive	4	185	98	22	8	317
	Dead	0	3	1	0	0	4
Control (Grazed)	Alive	7	139	72	13	5	236
	Dead	9	46	28	5	8	96

The number of ribes removed outright by trampling and through pulling by sheep while browsing has been extremely heavy on this plot. Responsible for this have been at least four major factors: steepness of slope, looseness of soil in the early summer season, abundance of ribes intermixed with many

species of less palatable brush, and better than a medium degree of grazing. It was observed that the roots of many ribes had been partially removed or loosened the first year during grazing. Practically all these ribes were found to have been eliminated during the second season. Many still recorded as alive have little likelihood of surviving one or more years of the heavier type of early summer cropping.

Located on the slope opposite plot 4 is plot 5. This area has a southern aspect and contains only about 70 per cent of the forage population found on plot 4. The area receives approximately the same intensity of grazing as the opposite exposure of the drainage, except that less time is actually involved for the sheeping. The ribes population runs heavier to R. viscosissimum on this slope while R. lacustre predominates on the northern face of the drainage. Data to indicate the results of two seasons grazing are shown in table 9.

TABLE 9

STATUS OF RIBES AND WHITE PINE SEEDLINGS IN 1941
AFTER TWO YEARS EARLY SUMMER GRAZING (PLOT 5,
SOUTH EXPOSURE, ST. JOE FOREST)

Type of Plot	Status of Bush	Number Ribes by Year of Origin					
		1937	1938	1939	1940	1941	Total
Exclosure (Ungrazed)	Alive	4	35	12	1	0	52
	Dead	0	1	0	0	0	1
Control (Grazed)	Alive	0	83	16	1	0	100
	Dead	1	17	8	1	0	27

About 21 per cent of the ribes has been removed from the control of this plot by the action of sheep as compared to 29 per cent for plot 4. Nearly all germination of ribes seed was complete by the second season following logging. On this area there is no evidence that the action of sheep will cause continued germination of ribes seed beyond the period normally associated with the logging disturbance. The results of two seasons study of plots 4 and 5 clearly indicate that this intensity of grazing carried on during the early summer season has been responsible for a large mortality of ribes seedlings. Of the small number of pine seedlings germinating, caused directly by the action of sheep, no loss has been observed.

The Effect of Controlled Grazing on the Germination, Growth and Development of Ribes and Western White Pine on Cutover Areas

To determine the influence of controlled intensities of grazing upon the plants occurring on cutover white pine lands, a $2\frac{1}{2}$ -acre fenced area was established. This fenced area was divided into two 1-acre enclosures and one $\frac{1}{2}$ -acre exclosure. The two enclosures were grazed for the first time under controlled conditions in 1939. Both were cropped by 50 head of sheep composed of 22 ewes and 28 lambs. The enclosure designated section A was grazed for a period of three days and section C for a period of two days. This was at a utilization

rate of 14 acres per animal unit for section A and 21 acres per animal unit for section C. Section B remained ungrazed. Using about the same number of sheep divided between lambs and ewes, the two enclosures will be grazed annually under similar restrictions until sufficient information has been obtained to serve the purpose of the study.

The task of securing information on the regeneration and development of ribes as affected by known intensities of grazing was assigned to the Methods Project in 1940. Information relative to the proper utilization of range lands and the effects of sheeping on coniferous reproduction is being obtained by one or more men assigned by the School of Forestry at the University of Idaho. The first report given on the status of ribes is presented on pages 129 to 131 of the 1940 annual report. The results of the 1941 check are shown in table 10 of this report.

TABLE 10

STATUS OF RIBES SEEDLINGS IN 1941 AFTER THREE YEARS
OF CONTROLLED GRAZING (PLOT 8, NORTH AND
SOUTH EXPOSURES, CLEARWATER FOREST)

Type of Plot	Status of Bush	Number Ribes by Year of Origin				
		1935-38	1939	1940	1941	Total
Section A	Alive	9	2	0	0	11
Grazed 3 days	Dead	5	1	0	0	6
Section B	Alive	26	0	0	0	26
Ungrazed	Dead	0	0	0	0	0
Section C	Alive	14	0	0	0	14
Grazed 2 days	Dead	0	0	0	0	0

Ribes that were present on the area prior to the establishment of the plots are shown under the dates 1935 to 1938. A total of six ribes has been destroyed by sheep on section A, while no loss of ribes has occurred either naturally within section B, the ungrazed control, or by the action of sheeping for two days on section C. Except for two ribes that became established in 1939 in stream type of section A, no additional seedlings have appeared.

For the 11 ribes alive on section A, average measurements per bush are as follows: height, 1.18 feet; live stem, 3.40; number of main stems, 2.00; number of laterals, 6.09; and number of leaves per bush, 31.73. For the 14 ribes alive on section C, which was grazed for a period of two days, average measurements per bush were found to be: height, 1.11 feet; live stem, 3.84 feet; number of main stems, 2.43; number of laterals, 7.71; and 32.57 leaves per bush. For the 13 ribes alive on section B, the ungrazed control, average measurements per bush were found to be: height, 1.22 feet; live stem, 4.43 feet; number of main stems, 2.00; number of laterals, 10.69; and 49.85 leaves per bush. These comparisons show that ribes within the ungrazed control had structural developments in excess of those on the enclosures for all morphological parts except number of main stems. This might be accounted for by the fact that the area was grazed for two or three years before the

establishment of the plots, and that the ribes within the enclosure have since had an opportunity to attain normal development. This also appears to be the explanation for the greater number of laterals and leaves which always follow the light cropping of terminal buds. In contrast is the severe type of grazing found in the enclosures wherein the structural development of nearly all bushes is materially obstructed.

The Effects of Deferred Grazing on the Germination, Growth and Development of Ribes and Western White Pine

Investigations were started in 1940 on cutover land in the Clearwater Forest to determine whether the conditions for ribes eradication could be materially improved by the deferment of grazing until adequate control measures could be established. On many areas of this type in the southern part of this forest it has been found difficult to eradicate sufficient ribes to meet exacting control standards due to the small size of large numbers of grazed bushes. It has been the general opinion that grazing is responsible for the establishment of many new ribes and they are held in a dwarfed condition by the moderate to severe annual grazing of sheep on these areas. The present study will serve to answer these questions by comparing the morphologic development of ribes exposed to grazing with those deferred from grazing, and by showing the status of new ribes seedlings under both conditions. The first report on these studies is presented on pages 128 and 129 of the 1940 annual report.

The results of two seasons study are shown in table 11 for a north exposure and in table 12 for a south exposure. Seedlings that became established succeeding logging and until the time protection was given by construction of an enclosure, have been grouped under the years 1935 to 1938. Although the enclosure was not established until 1940, the 1939 seedlings and those germinating through 1941 are shown under separate columns in the table. An examination of the data shown in table 11 presents a striking comparison between the number of ribes seedlings becoming established within the enclosure as against the number appearing on the area grazed annually.

TABLE 11

STATUS OF RIBES AND WHITE PINE SEEDLINGS AFTER TWO YEARS MIDSUMMER GRAZING (PLOT 6, NORTH EXPOSURE, CLEARWATER FOREST)

Type of Plot	Status of Plant	Number Pine by Year of Origin					Number Ribes by Year of Origin				
		1935-1938	1939	1940	1941	Total	1935-1938	1939	1940	1941	Total
Enclosure	Alive	174	42	32	22	270	32	18	26	22	98
	Dead	2	0	0	0	2	6	8	4	0	18
Control	Alive	198	29	35	31	293	27	6	3	5	41
	Dead	4	0	0	0	4	1	2	0	0	3

It seems quite evident that sheep have caused neither an increase nor a decrease in pine seedlings. On the other hand, ribes seed within the exclosure have germinated at a rate of three to nine times that for the control. New seedlings observed on the control are becoming established in the protection of some obstacle such as a log or stump, or beneath brush. Those that are germinating within the exclosure are found generally distributed over the entire plot. There is every reason to believe that the deferment of grazing has favored the appearance of many new ribes seedlings. It is likely that the continued disturbance caused by the trampling of sheep either creates an unfavorable medium for germination, or few seed are left near the soil surface long enough to germinate. In either case the results so far obtained from this investigation show that on the better ribes sites deferred grazing has increased the number of new seedlings over the area that remains open to grazing.

For the 98 ribes bushes alive within the exclosure average measurements per bush are as follows: height, .49 feet; live stem, .73 feet; number of main stems, 1.04; number of laterals, 1.16; and 10.08 leaves per bush. For the 41 alive bushes on the control average measurements per bush were found to be: height, .68 feet; live stem, 1.21 feet; number of main stems, 1.07; number of laterals, 3.17; and 18.54 leaves per bush. Although the morphological differences are not marked, an average bush on the control is commencing to show the development of a few more leaves and laterals on stems devoid of terminal buds, than will be found on a comparable bush within the exclosure.

The area surrounding plot 7 represents a full southern aspect with surface soils drying early in July. Fewer plant species of a palatable nature are present and the bulk of the vegetative population tends toward the more site-tolerant species such as huckleberry and thimbleberry. The results of two seasons study are shown in table 12.

TABLE 12

STATUS OF RIBES AND WHITE PINE SEEDLINGS AFTER TWO YEARS MIDSUMMER GRAZING (PLOT 8, NORTH EXPOSURE, CLEARWATER FOREST)

Type of Plot	Status of Plant	Number Pine by Year of Origin					Number Ribes by Year of Origin				
		1935-1938	1939	1940	1941	Total	1935-1938	1939	1940	1941	Total
Exclosure	Alive	420	84	28	18	550	29	8	2	4	43
	Dead	14	5	0	0	19	6	0	0	0	6
Control	Alive	429	49	32	25	535	32	6	5	1	44
	Dead	8	2	0	0	10	4	0	2	0	6

The number of pine seeds germinating within the exclosure and those on the control have been about equal. The large number of white pine seed trees in the vicinity of plot 8 has maintained a large seed supply, and has resulted in a heavier germination than on plot 7. Pine seedlings are becoming established on this area with smaller losses than those recorded for ribes. Responsible for this may be the ability of pine seedling roots to penetrate

vertically at a more rapid rate of development and at an earlier date in the season than can roots of ribes. All of the pine seedlings found dead on this area, and also on plot 6, were killed by blister rust.

The number of ribes germinating within the enclosure and on the control has been about evenly divided for the years of germination. Two ribes were found to have been removed by the action of sheep on the control. It would appear that since the upper soil layer dries early in summer, the site is naturally unfavorable for any amount of ribes seed germination. On the most favorable sites such as represented by plot 6, it was observed that soil kept in a loose state on the control dried much faster than the same soil zone within the enclosure, consequently the greater germination occurred where the heavier moisture content prevailed and remained over a longer period of the season.

For the 43 ribes bushes alive within the enclosure, average measurements per bush are as follows: height, .61 feet; live stem, 1.58 feet; number of main stems, 1.21; number of laterals, 2.79; and 15.42 leaves per bush. For the 44 bushes alive on the control, average measurements per bush were found to be: height, .68 feet; live stem, 1.07; number of main stems, 1.39; number of laterals, 2.71; and 14.59 leaves per bush. At this early date no significant morphological differences between ribes bushes on the protected area and those on the control would be found.

The two photographs, W 106 and W 120 exhibited as Plate 1 show the type of enclosure constructed and conditions surrounding plot 7. The stakes with white tops mark the location of ribes and the plain cedar stakes mark the location of white pine seedlings. Stakes three to four inches above the ground level have been used for seedlings on the area being grazed in order not to interfere with the normal movement of sheep.

STATISTICS OF RIBES AND WHITE PINE SEEDLINGS WITHIN TWO YEAR ENCLOSURES
(PLOT 6, NORTH HAZEL HILL, CLEARCROFT FOREST)

Year of Germination	Enclosure				Control			
	Height (ft.)	Live Stem (ft.)	Main Stems	Laterals	Height (ft.)	Live Stem (ft.)	Main Stems	Laterals
1932	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1933	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1934	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1935	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1936	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1937	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1938	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1939	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1940	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1941	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1942	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1943	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1944	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1945	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1946	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1947	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1948	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1949	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1950	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1951	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1952	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1953	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1954	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1955	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1956	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1957	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1958	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1959	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1960	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1961	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1962	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1963	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1964	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1965	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1966	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1967	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1968	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1969	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1970	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1971	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1972	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1973	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1974	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1975	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1976	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1977	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1978	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1979	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1980	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1981	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1982	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1983	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1984	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1985	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1986	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1987	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1988	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1989	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1990	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1991	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1992	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1993	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1994	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1995	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1996	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1997	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1998	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
1999	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71
2000	0.61	1.58	1.21	2.79	0.68	1.07	1.39	2.71



Plot deferring grazing from cutover land with grazed check plot adjacent (W 106) and a detailed perspective of a milacre subplot within exclosure (W 120). Stakes with painted tops mark ribes; unpainted mark white pine.

PHOTOGRAPHIC AND EDUCATIONAL WORK, 1941

By

Edward L. Joy, Forester

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During 1941 photographic and educational work included activities on a wide variety of subjects. Photographic department work covered still and moving picture making in both monochrome and color, laboratory processing, Multilith, black-line printing, mimeograph reproducing, drafting and motion picture production. Many of these services are provided for both the Northwestern and the Sugar Pine Regions. In addition, the office of Pear Psylla Control, the Army, and to a lesser extent other agencies, were rendered assistance in photography and machine duplication.

The educational work, which is a joint undertaking of all members of the technical staff, included the use of lectures, both with and without slides; slides giving the blister rust story in automatic and continuous projection; the motion picture on blister rust; pamphlets; posters; preserved specimens of the rust; photographs; and news items. Of these the moving picture, which was shown in revised form after midyear, was used most extensively.

The following reports give detailed information on the work of each of these projects:

A. Photographic Section

The photographic section has as its major objectives: (1) The maintenance of a pictorial record of control and investigative work. (2) The provision of photographs, maps, charts, manuals and other material necessary to facilitate the conduct and reporting of field work. (3) The production of illustrative material for educational purposes. Added to this in 1941 was the work of producing materials for military establishments in connection with national defense.

All types of regular work outlined in the objectives of this department were performed in 1941. In spite of the fact that the continuous rains of the year greatly reduced the usual amount of time favorable for field photography, all urgent pictures for the Northwestern Region were secured. Laboratory work included the reproduction of maps, charts, reports and other items for both field and office uses. For educational work the production of natural color lantern slides and motion pictures, and photographs was continued.

In 1941 greater use was made of the Multilith machine for reproducing various material in both black and white and color. Forms, tables, graphs, charts, maps and photographs are included. Examples of this type of work, with special reference to multicolored maps, are to be found in this and the 1940 volumes of "Blister Rust Control Work in the Far West."

The black-line printing machine continued to serve well the needs of this agency and the Pear Psylla Control unit in producing large numbers of maps for field and report uses. Pear Psylla Control, due to an expanded program,

required even a larger quantity of maps than in 1940, most of which were produced by their operator. Color photography for both lantern slides and motion pictures was again used to a large extent. Of particular interest and value were motion pictures made with the micro attachment showing magnifications of the various stages of rust development. These became an important addition to the film, "The Story of White Pine Blister Rust," the revision of which was accomplished during the first part of the year.

During the year the mimeographing machine was added to the equipment of this unit. Its operation was handled jointly by photographic and stenographic personnel, depending on the availability of an operator. This piece of equipment was also used for Pear Psylla Control work, most of which was produced by their operator.

The summary of 1941 reproduction work by photographic and machine methods, including that done by other agencies, is given in the following table:

PHOTOGRAPHIC, MULTILITH, BLACK-LINE AND MIMEOGRAPH WORK

Item	Northwestern Region	Sugar Pine Region -	Other Agencies	Total
PHOTOGRAPHIC				
Lantern slides, black & white	10		11	21
natural color	96			96
Films, developed, field films	164			164
Copies, 5x7			72	72
8x10	221	24	117	362
Printing, 4x5 or smaller		200	15	215
5x7	959	10		969
9x11	1,566	2,460	98	4,124
Enlarging, 11x14 or smaller	23	24	146	193
16x20	11	96	180	287
30x40	10			10
Movie film, 50 ft. rolls	2			2
100 ft. rolls	8		1	9
Total Items	3,070	2,814	640	6,524
MULTILITH				
Copies	94	6	35	135
Plates made	141	11	56	208
Cards printed	2,000	3,000	59,000	64,000
Cards printed, reverse		3,000	31,000	34,000
Total cards	2,000	6,000	90,000	98,000
Paper printed	98,600	15,700	243,500	362,300
Paper printed, reverse	20,000	6,000	41,500	67,500
Total paper	118,600	21,700	290,000	430,300
Total Items	120,835	27,717	380,091	528,643
BLACK-LINE PRINTER				
Total maps, printed	786	16	2,867	3,669
MIMEOGRAPH				
Total paper	42,880			42,880
Grand Total All Items	167,571	30,547	383,598	581,716

B. Educational Section

The demands for informational and instructional material pertaining to blister rust and its control appear to be reasonably well cared for by such media as those used at present. These include bulletins, posters, pictures, lantern slides, motion pictures, lectures and preserved specimens. During 1941 the year-old, locally produced motion picture was thoroughly revised to include scenes that were not available in 1940 and to improve sequence and timing. The result brought favorable comment and a wider usage, especially for worker training and educational purposes. A further improvement, that should be accomplished with the next revision, will be the addition of sound.

To provide informational and educational material where and when it is desired is a joint undertaking by all members of the staff. During the period of worker training every usable medium is made available. Beyond this the high schools and colleges receive considerable attention in connection with their science courses. A third field includes groups such as clubs and societies and the individuals who call or write for material.

There follows a brief summary of the range of use in 1941 of the material listed:

1. Bulletins, posters and specimens. Bulletins issued in 1941 were the same as those used in the preceding two years. Numbering about ten, these cover the field of blister rust and its control quite thoroughly, although some are becoming obsolete. Other items, used with the bulletins, are the poster and a letter-size spread map for the United States. The total of all bulletins, posters and maps distributed in 1941 was approximately 1,000.

The preserved specimens used in 1941, although from stock several years old, served satisfactorily for every request. These include specimens in 6" x 9" display boxes and bulk specimens in jars. Included in the total of 24 pints of infected leaves and two quarts and 60 tubes of cankers that were sent were orders for the Universities of California and Colorado.

2. Talks, slides and motion picture. Very few talks on blister rust, except the question and answer type following the blister rust movie showing, were given in 1941. Although lantern slides are still used occasionally, the motion picture continued for the second year as the most desired feature. Following the film's revision it was in even greater demand than before. Two copies are used by the Bureau and one by the Forest Service. Although no record of Forest Service showings is available, the Bureau prints of both the original and the revised editions were projected 43 times to a total of 2,081 people.

3. Fairs and exhibits. During 1941 only the Bonner County Fair at Sandpoint, Idaho, had a blister rust exhibit. This was a Forest Service display for which this office provided materials. In addition, the blister rust film was used along with other forest films in a tent showhouse operated by the Forest Service. For 1942 the blister rust diorama will be available as a new fair feature.

4. General publicity. Occasional news items on the blister rust work appeared in papers of this region during 1941. One full page feature story prepared by a WPA writer to depict the part of the WPA in blister rust control appeared in a Spokane paper. This office assisted in this instance by providing some factual data and pictures.

APPENDIX

RESEARCH AND TECHNICAL, MANAGEMENT DIVISION OF BUREAU OF LANDS
CALENDAR YEAR 1941, MONTHLY APPROPRIATIONS

Project	Salaries	Expenses	Total
January 1 to June 30, 1941			
3.2 Cooperative River Investigation on Federal Lands			
3.21-2 - Central National Forest, Idaho	\$ 1,300.00	\$ 180.37	\$ 1,480.37
3.22 - Method Studies of River Investigation, Idaho	1,200.00	1.00	1,201.00
3.7 Cooperative River Investigation on National Parks			
3.71 - Glacier National Park, Montana		91.04	91.04
3.72-1 - Mount Baker National Park, Washington		40.00	40.00
3.4 Cooperative River Investigation on State and Private Lands			
3.41-1 - Clearwater Operation, Idaho	4,475.00	2,100.00	6,575.00
3.42-2 - St. Joe Operation, Idaho	4,775.00	1,000.00	5,775.00
3.43-3 - Perry d'Almeida Operation, Idaho	1,000.00		1,000.00
3.44-4 - Kootenai Operation, Idaho	2,475.00	2,100.00	4,575.00
3.45-5 - Kootenai Operation, Idaho	500.00	818.00	1,318.00
3.46-6 - Kootenai Operation, Washington	200.00	8.40	208.40
4.1 State Studies, Approval of the Dept			
4.11 - Idaho	2,200.00	100.00	2,300.00
4.12 - Washington		10.00	10.00
5. Miscellaneous Fees	1,000.00	18.00	1,018.00
6. Maintenance of Field Office and Miscellaneous Expenses			
6.1 - Supervision	4,000.00	245.71	4,245.71
6.2 - Office Maintenance and	5,041.00	200.00	5,241.00
6.3 - Miscellaneous Expenses			
Grand Total January 1 to June 30, 1941	\$20,740.00	\$7,710.00	\$28,450.00
July 1 to December 31, 1941			
1. Planning Coordination and Technical Direction			
1.1 - Clearwater Operation, Idaho	1,000.00	175.00	1,175.00
1.2 - St. Joe Operation, Idaho	4,100.00	400.00	4,500.00
1.3 - Perry d'Almeida Operation, Idaho	1,000.00		1,000.00
1.4 - Kootenai Operation, Idaho	1,000.00	200.00	1,200.00
1.5 - Kootenai Operation, Idaho	500.00	9.00	509.00
1.6 - St. Joe Operation, Washington	200.00	2.10	202.10
1.7 - Colville Operation, Montana	1,000.00	100.00	1,100.00
1.8 - National Park, Glacier	200.00	104.00	304.00
1.9 - National Park, Mount Rainier	200.00	00.00	200.00
1.10 - National Park, Mount Rainier	200.00	00.00	200.00
1.11 - National Park, Yellowstone	200.00	100.00	300.00
1.12 - Office Maintenance	4,000.00	1,010.00	5,010.00
1.13 - Supervision	4,000.00	200.00	4,200.00
1.14 - Inspection and Information	1,000.00	200.00	1,200.00
1.15 - Control Organization	1,000.00	40.00	1,040.00
1.16 - Methods Development	100.00	0.00	100.00
Total, Project 1, July 1 to December 31, 1941	\$20,740.00	\$8,000.00	\$28,740.00
2. Cooperative River Investigation on State and Private Lands			
2.1 - Clearwater Operation, Idaho	1,000.00	100.00	1,100.00
2.2 - St. Joe Operation, Idaho	4,000.00	241.00	4,241.00
2.3 - Kootenai Operation, Idaho	1,000.00	200.00	1,200.00
Total, Project 2, July 1 to December 31, 1941	\$6,000.00	\$641.00	\$6,641.00

TABLE 1

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
CALENDAR YEAR 1941, REGULAR APPROPRIATIONS

Project	Salaries	Expense	Total
January 1 to June 30, 1941			
3.2 Cooperative Ribes Eradication on Federal Lands			
3.21-2 - Cabinet National Forest, Montana	\$ 1,350.00	\$ 120.17	\$ 1,470.17
3.22 - Method Studies of Ribes Eradication, Idaho	1,382.06	1.50	1,383.56
3.3 Cooperative Ribes Eradication on National Parks			
3.31 - Glacier National Park, Montana		91.24	91.24
3.33-1 - Mount Rainier National Park, Washington		49.64	49.64
3.4 Cooperative Ribes Eradication on State and Private Lands			
3.42-1 - Clearwater Operation, Idaho	4,975.06	2,124.21	7,099.27
3.42-2 - St. Joe Operation, Idaho	6,734.84	3,456.99	10,191.83
3.42-3 - Coeur d'Alene Operation, Idaho	1,350.00		1,350.00
3.42-4 - Kaniksu Operation, Idaho	3,439.40	2,263.93	5,703.33
3.42-5 - Mount Spokane Operation, Idaho	825.00	212.23	1,037.23
3.43-2 - Mount Spokane Operation, Washington	825.00	2.43	827.43
4.1 Field Studies, Spread of the Rust			
4.12 - Idaho	3,249.96	182.27	3,432.23
4.13 - Washington		10.00	10.00
6. Educational Work	1,650.00	16.09	1,666.09
9. Maintenance of Field Office and Miscellaneous Expenses			
9.1 - Supervision	4,299.96	248.71	4,548.67
9.2 - Office Maintenance and			
9.3 - Miscellaneous Expenses	8,641.85	930.84	9,572.69
Grand Total January 1 to June 30, 1941	\$38,723.13	\$9,710.25	\$48,433.38
July 1 to December 31, 1941			
1. Planning Coordination and Technical Direction			
1.1 - Clearwater Operation, Idaho	1,500.00	176.36	1,676.36
1.2 - St. Joe Operation, Idaho	2,124.98	408.45	2,533.43
1.3 - Coeur d'Alene Operation, Idaho	1,387.49		1,387.49
1.4I - Kaniksu Operation, Idaho	675.00	364.54	1,039.54
1.5I - Mount Spokane Operation, Idaho	550.00	9.87	559.87
1.5W - Mount Spokane Operation, Washington	296.11	2.15	298.26
1.6C - Cabinet Operation, Montana	1,350.00	125.33	1,475.33
1.7G - National Park, Glacier	275.00	104.03	379.03
1.7GT - National Park, Grand Teton	197.57	89.28	286.85
1.7R - National Park, Mount Rainier	325.00	37.29	362.29
1.7Y - National Park, Yellowstone	395.18	151.66	546.84
1.A - Office Maintenance	8,737.38	1,219.20	9,956.58
1.B - Supervision	4,067.75	223.93	4,291.68
1.C - Education and Information	1,986.00	309.78	2,295.78
1.D - Control Investigations	3,698.27	41.86	3,740.13
1.E - Methods Development	195.00	2.51	197.51
Total, Project 1, July 1 to December 31, 1941	\$28,260.73	\$3,266.24	\$31,526.97
3. Cooperative Ribes Eradication on State and Private Lands			
3.1 - Clearwater Operation, Idaho	1,500.00	628.01	2,128.01
3.2 - St. Joe Operation, Idaho	2,058.32	541.93	2,600.25
3.4 - Kaniksu Operation, Idaho	1,282.60	799.92	2,082.52
Total, Project 3, July 1 to December 31, 1941	\$ 4,840.92	\$1,969.86	\$ 6,810.78

TABLE 2

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
JANUARY 1 TO JUNE 30, 1941
401087-651999 EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE
FEDERAL NON-CONSTRUCTION PROJECTS (TRANSFER FROM W.P.A.) 1941

Project	Salaries	Expense	Total
101-2-92-7, Idaho			
8.12 - Field Studies, Pine Disease Survey	\$ 671.28	\$ 59.82	\$ 731.10
8.22 - Method Studies of Ribes Eradication		55.00	55.00
8.42-1 - Cooperative Ribes Eradication, Clearwater Operation	4,795.52	3,130.84	7,926.36
8.42-2 - Cooperative Ribes Eradication, St. Joe Operation	4,253.05	3,325.38	7,578.43
8.42-3 - Cooperative Ribes Eradication, Coeur d'Alene Operation	117.84	103.65	221.49
8.42-4 - Cooperative Ribes Eradication, Kaniksu Operation	18,697.45	3,213.08	21,910.53
8.42-5 - Cooperative Ribes Eradication, Mount Spokane Operation	2,904.13	1,093.09	3,997.22
8.6 - Educational Work		225.10	225.10
8.9-1 - Supervision		-40.03*	-40.03
8.9-2 - Spokane Office Maintenance and			
8.9-3 - Miscellaneous Expenses	117.84	5,451.21	5,569.05
Total 101-2-92-7, Idaho	31,557.11	16,617.14	48,174.25
101-2-93-17, Washington			
8.13 - Field Studies, Pine Disease Survey	1,584.24		1,584.24
8.33-1 - Cooperative Ribes Eradication, Mount Rainier National Park		12.57	12.57
8.43-1 - Cooperative Ribes Eradication, Kaniksu Operation	96.76		96.76
8.43-2 - Cooperative Ribes Eradication, Mount Spokane Operation	2,093.37	89.77	2,183.14
8.6 - Educational Work	593.43	55.47	648.90
8.9-1 - Supervision		18.75	18.75
8.9-2 - Spokane Office Maintenance and	3,910.31	691.03	4,601.34
8.9-3 - Miscellaneous Expenses			
Total 101-2-93-17, Washington	8,278.11	867.59	9,145.70
Grand Total January 1 to June 30, 1941	\$39,835.22	\$17,484.73	\$57,319.95
401008-651999 EMERGENCY RELIEF, AGRICULTURE ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1941			
101-9-00-1, Washington			
8.6 - Educational Work		5.96	5.96
8.9-1 - Supervision		35.94	35.94
8.9-2 - Spokane Office Maintenance and			
8.9-3 - Miscellaneous Expenses	2,031.79	2,045.36	4,077.15
Total Administrative, 401008	\$ 2,031.79	\$ 2,087.26	\$ 4,119.05

*Vouchers covering operation of passenger car paid during previous calendar year transferred to regular funds in June, 1941.

TABLE 3

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
JULY 1 TO DECEMBER 31, 1941
801085-652999 EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE
FEDERAL NON-CONSTRUCTION PROJECTS CONTINUED, (TRANSFER FROM W.P.A.) 1942 - DECEMBER 31, 1941

Project	Salaries	Expense	Total
201-2-92-16, Idaho			
8.1 - Cooperative Ribes Eradication, Clearwater Operation	\$ 5,176.36	\$ 1,304.90	\$ 6,481.26
8.2 - Cooperative Ribes Eradication, St. Joe Operation	5,803.68	1,714.89	7,518.57
8.3 - Cooperative Ribes Eradication, Coeur d'Alene Operation		133.20	133.20
8.4I - Cooperative Ribes Eradication, Kaniksu Operation	23,830.53	2,881.99	26,712.52
8.5I - Cooperative Ribes Eradication, Mount Spokane Operation	4,787.11	479.45	5,266.56
8.A - Office Maintenance		1,196.18	1,196.18
8.B - Supervision		13.40	13.40
8.C - Education and Information		81.99	81.99
8.D - Control Investigations		123.33	123.33
8.E - Methods Development		14.50	14.50
Total 201-2-92-16, Idaho	39,597.68	7,943.83	47,541.51
201-2-93-60, Washington			
8.4W - Cooperative Ribes Eradication, Kaniksu Operation	547.80	172.13	719.93
8.5W - Cooperative Ribes Eradication, Mount Spokane Operation	7,874.13	1,484.02	9,358.15
8.7R - Cooperative Ribes Eradication, Mount Rainier National Park		43.00	43.00
8.A - Office Maintenance	446.40	442.07	888.47
8.C - Education and Information		97.84	97.84
8.D - Control Investigations	440.91	19.00	459.91
Total 201-2-93-60, Washington	9,309.24	2,258.06	11,567.30
Grand Total July 1 to December 31, 1941, 801085	\$48,906.92	\$10,201.89	\$59,108.81
801006-652999 EMERGENCY RELIEF, AGRICULTURE, CONTINUATION OF EXISTING PROJECTS, ADMINISTRATIVE EXPENSES (TRANSFER FROM W.P.A.) 1942 - DECEMBER 31, 1941			
201-9-00-1, Administrative			
8.A - Office Maintenance	2,274.96	174.23	2,449.19
8.C - Education and Information		69.42	69.42
8.7R - Cooperative Ribes Eradication, Mount Rainier National Park		39.00	39.00
Total Administrative, 801006	\$ 2,274.96	\$ 282.65	\$ 2,557.61

TABLE 4

SUMMARY OF EXPENDITURES FROM STATE AND PRIVATE FUNDS
1928 - 1941 IDAHO

Year	State	Private	Total
1928	\$ 2,518.55	\$ 2,264.32	\$ 4,782.87
1929		19,027.66	19,027.66
1930		20,000.00	20,000.00
1931	5,000.00	35,905.32	40,905.32
1932	8,003.43	11,186.33	19,189.76
1933			
1934	29,154.06		29,154.06
1935	15,000.00		15,000.00
1936	16,998.25		16,998.25
1937	15,001.25		15,001.25
1938	15,000.44		15,000.44
1939	15,438.04		15,438.04
1940	10,034.48		10,034.48
1941	7,542.73	15,756.40	23,299.13
Total	\$139,691.23	\$104,140.03	\$243,831.26

TABLE 5

SUMMARY OF FEDERAL EXPENDITURES BY ACTIVITIES, NORTHWESTERN REGION
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
1941

State	Appropriation	Total Expenditures	Ribes Eradication	Methods Development	Pre-Eradication	Control Investigation	Disease Survey	Canker Elimination	Education and Information	Office and Miscellaneous	Supervision
Idaho	Regular	\$ 69,123.89	\$22,243.44	\$1,383.56		\$ 5,909.01			\$2,583.27	\$13,670.57	\$23,334.04
	ERA	101,245.76	66,852.79	69.50		854.43	\$1,153.69	\$19,739.66	307.09	12,259.29	9.31
	Total	170,369.65	89,096.23	1,453.06		6,763.44	1,153.69	19,739.66	2,890.36	25,929.86	23,343.35
Montana	Regular	9,090.83		98.75		636.66			684.30	2,929.35	4,741.77
Washington	Regular	7,722.72		98.76		636.69			694.30	2,929.35	3,363.62
	ERA	21,859.66	8,624.04			2,044.15		3,828.51	822.12	6,522.09	18.75
	Total	29,582.38	8,624.04	98.76		2,680.84		3,828.51	1,516.42	9,451.44	3,382.37
Total Western White Pine Region	Regular	85,937.44	22,243.44	1,581.07		7,182.36			3,961.87	19,529.27	31,439.43
	ERA	123,105.42	75,476.83	69.50		2,898.58	1,153.69	23,568.17	1,129.21	18,781.38	28.06
	Total	209,042.86	97,720.27	1,650.57		10,080.94	1,153.69	23,568.17	5,091.08	38,310.65	31,467.49
Wyoming	Regular	833.69			\$833.69						
Total Northwestern Region	Regular	86,771.13	22,243.44	1,581.07	833.69	7,182.36			3,961.87	19,529.27	31,439.43
	ERA	123,105.42	75,476.83	69.50		2,898.58	1,153.69	23,568.17	1,129.21	18,781.38	28.06
	Total	\$209,876.55	\$97,720.27	\$1,650.57	\$833.69	\$10,080.94	\$1,153.69	\$23,568.17	\$5,091.08	\$38,310.65	\$31,467.49

TABLE 1
SUMMARY OF 1941 RIBES ERADICATION

State	Initial Eradication Work				Reeradication Work				Totals				Per Cent Initial Eradication Worked**
	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man-Days	
		Wild	Cultivated			Wild	Cultivated			Wild	Cultivated		
Idaho	11,676	2,806,320	-	17,615	41,218	3,767,603	-	48,151	52,894	6,573,923	-	65,766	0.55
Montana	4,579	333,862	-	2,720	2,387	313,899	-	3,374	6,966	647,761	-	6,094	2.35
Washington	3,970	591,104	-	1,185	7,387	956,992	-	5,220	11,357	1,548,096	-	6,405	2.34
Total	20,225	3,731,286	-	21,520	50,992	5,038,494	-	56,745	71,217	8,769,780	-	78,265	0.81

*Number 8-hour man-days = hours worked per day x number men
8

**Percentage of total white pine control acreage in state that was worked during 1941.

State	Ribes Per Acre		Man-Days Per Acre		Number of Camps				Number of Employees*					
	Initial Eradication	Reeradication	Initial Eradication	Reeradication	C.C.C. and S.C.S.	W.P.A.	Regular	Total	Laborers				All Supervision	Total Employees
									C.C.C. and S.C.S.	W.P.A.	Regular	Total		
Idaho	240	91	1.51	1.17	9	6	30	45	252	147	1,095	1,494	88	1,582
Montana	73	132	.59	1.41	2	1	3	6	62	29	90	181	11	192
Washington	149	130	.30	.71	1	1	6	8	35	53	165	253	11	264
Total	184	99	1.06	1.11	12	8	39	59	349	229	1,350	1,928	110	2,038

*Enter the maximum number of persons on the pay roll at the peak of the season.
Total number persons employed is not desired because the large turnover in W.P.A. camps would result in an exaggerated figure.

TABLE 1A
SUMMARY OF ALL RIBES ERADICATION 1918-1941 (INCLUSIVE)

State a	Total Acreage White Pine b	Acreage White Pine Worth Protection c	Acreage Control Areas (White Pine and Protective Zones) d	Acreage Reported Initially Worked e	Initial Eradication Work			
					Net Acreage Worked in Control Areas f	Number Ribes Destroyed		Number 8-Hour Man-Days i
						Wild g	Cultivated h	
Idaho	2,307,655	2,307,655	2,122,119	1,632,535	1,632,535	319,339,461	-	1,311,903
Montana	220,740	220,740	194,544	127,860	127,860	16,544,909	-	88,124
Washington	169,349	169,349	169,349	123,132	123,132	27,867,976	-	102,361
Subtotal	2,697,744	2,697,744	2,486,012	1,883,527	1,883,527	363,552,346	-	1,502,388
Colorado	550,000*	206,000*	206,000*	14,859	14,859	410,649	-	6,292
Wyoming	3,754,000*	307,800*	251,700*	21,760	21,760	1,085,771	-	6,940
Subtotal	4,304,000	513,800	457,700	36,619	36,619	1,496,420	-	13,232
Total	7,001,744	3,211,544	2,943,712	1,920,146	1,920,146	365,048,766	-	1,515,620

*Indefinite

State s	Reeradication				Total				Percent Initial Eradication Worked*	Per Acre			
	Acreage Worked b	Number Ribes Destroyed		Number 8-Hour Man-Days e	Net Acreage Worked in Control Areas f	Number Ribes Destroyed		Number 8-Hour Man-Days i		Ribes		Man-Days	
		Wild c	Cultivated d			Wild g	Cultivated h			Initial Eradication	Re- eradication	Initial Eradication	Re- eradication
Idaho	360,481	53,342,571	-	393,783	1,993,016	372,682,032	-	1,705,686	76.93	196	148	.80	1.09
Montana	10,500	1,428,780	-	13,644	138,360	17,773,689	-	101,768	65.72	128	136	.69	1.30
Washington	36,620	5,707,996	-	33,649	159,752	33,575,972	-	136,010	72.71	226	156	.83	.92
Subtotal	407,601	60,479,347	-	441,076	2,291,128	424,031,693	-	1,943,464	75.77	193	148	.80	1.08
Colorado	1,962	86,886	-	664	16,821	497,535	-	6,956	7.2	28	44	.42	.34
Wyoming	-	-	-	-	21,760	1,085,771	-	6,940	8.6	50	-	.32	-
Subtotal	1,962	86,886	-	664	38,581	1,583,306	-	13,896	8.0	41	44	.36	.34
Total	409,563	60,566,233	-	441,740	2,329,709	425,614,999	-	1,957,360	65.23	190	148	.79	1.08

*Percentage of total white pine control area in state that has been worked initially.

TABLE 2

SUMMARY OF 1941 RIBES ERADICATION BY PROGRAMS
(Including All Work - Initial and Reeradication)

State	Total Acreage Worked (Initial and Reeradication)	Regular and Cooperative*				W.P.A. and E.R.A.			
		Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man-Days
			Wild	Cultivated			Wild	Cultivated	
Idaho	52,894	44,693	5,458,528	-	52,166	5,651	639,595	-	7,099
Montana	6,966	5,934	398,149	-	3,924	557	91,840	-	524
Washington	11,357	10,233	1,348,321	-	4,891	1,082	169,325	-	1,110
Total	71,217	60,860	7,204,998	-	60,981	7,290	900,760	-	8,733

*Include work done with "Lea" funds.

State	E.C.W. and S.C.S.				Totals			
	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man-Days
		Wild	Cultivated			Wild	Cultivated	
Idaho	2,550	475,800	-	6,501	52,894	6,573,923	-	65,766
Montana	475	157,772	-	1,646	6,966	647,761	-	6,094
Washington	42	30,450	-	404	11,357	1,548,096	-	6,405
Total	3,067	664,022	-	8,551	71,217	8,769,780	-	78,265

TABLE 2A

SUMMARY OF ALL RIBES ERADICATION BY PROGRAMS 1918-1941 (INCLUSIVE)
(Initial and Reeradication)

State	Total* Acreage Reported Worked (Initial and Reeradication)	Regular and Cooperative				W.P.A. and E.R.A.			
		Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man-Days
			Wild	Cultivated			Wild	Cultivated	
Idaho	1,993,016	549,791	95,441,448	-	423,653	500,970	91,269,072	-	411,890
Montana	138,360	19,464	2,834,701	-	20,088	57,800	6,300,829	-	41,591
Washington	159,752	25,341	6,956,530	-	21,087	39,973	13,632,288	-	53,107
Subtotal	2,291,128	594,596	105,232,679	-	464,828	598,743	111,202,189	-	506,588
Colorado	16,821	-	-	-	-	16,821	497,535	-	6,956
Wyoming	21,760	-	-	-	-	21,760	1,085,771	-	6,940
Subtotal	38,581	-	-	-	-	38,581	1,583,306	-	13,896
Total	2,329,709	594,596	105,232,679	-	464,828	637,324	112,785,495	-	520,484

*This column = column E, Table 1A plus column B, Table 1A, second section

State	E.C.W. and S.C.S.				P.W.A. or N.R.A.				Total Emergency Program (W.P.A.-E.C.W.-P.W.A.)			
	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed		Number 8-Hour Man-Days
		Wild	Cultivated			Wild	Cultivated			Wild	Cultivated	
Idaho	590,414	123,729,240	-	661,693	351,841	62,242,272	-	208,450	1,443,225	277,240,584	-	1,282,033
Montana	17,108	1,795,850	-	15,273	43,988	6,842,309	-	24,816	118,896	14,938,988	-	81,680
Washington	33,288	4,780,400	-	37,397	61,150	8,206,754	-	24,419	134,411	26,619,442	-	114,923
Subtotal	640,810	130,305,490	-	714,363	456,979	77,291,335	-	257,685	1,696,532	318,799,014	-	1,478,636
Colorado	-	-	-	-	-	-	-	-	16,821	497,535	-	6,956
Wyoming	-	-	-	-	-	-	-	-	21,760	1,085,771	-	6,940
Subtotal	-	-	-	-	-	-	-	-	38,581	1,583,306	-	13,896
Total	640,810	130,305,490	-	714,363	456,979	77,291,335	-	257,685	1,735,113	320,382,320	-	1,492,532

TABLE 3

SUMMARY OF ALL OTHER CONTROL WORK FOR 1941

State	Cultivated Black Current Eradication				Nursery Sanitation						Preeradication Survey	
	Number Inspections Made	Number Locations Found	Number Black Currants Destroyed	Number 8-Hour Man-Days	Number Nurseries Worked	Number White Pines in Nurseries	Number Acres Worked	Number Ribes Destroyed		Number 8-Hour Man-Days	Number Acres Mapped White Pine and Protection Zones	Number 8-Hour Man-Days
Idaho	-	-	-	-	-	-	-	-	-	-	49,000	350
Montana	-	-	-	-	1	9,360,000	421	35,370	-	412	-	-
Washington	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	-	-	-	1	9,360,000	421	35,370	-	412	49,000	350
Wyoming	-	-	-	-	-	-	-	-	-	-	5,800	22
Total	-	-	-	-	1	9,360,000	421	35,370	-	-	54,800	372

State	Treatment Infected Trees					Checking					
	Number Trees Examined	Number Trees Treated	Number Trees Removed	Number Cankers Removed	Number 8-Hour Man-Days	Advance		Post		Regular	
						Acreage Checked	Number 8-Hour Man-Days	Acreage Checked	Number 8-Hour Man-Days	Acreage Checked	Number 8-Hour Man-Days
Idaho	1,093,920	937,478	30,122	-	2,591	-	-	-	-	-	-
Montana	61,360	57,718	3,446	-	942	-	-	-	-	-	-
Washington	344,676	343,767	2,369	-	778	-	-	-	-	-	-
Total	1,499,956	1,338,963	35,937	-	4,311	-	-	-	-	-	-

TABLE 3A

SUMMARY OF ALL OTHER CONTROL WORK, 1918-1941 (INCLUSIVE)

State	Cultivated Black Current Eradication				Nursery Sanitation							
	Number Inspections Made	Number Locations Found	Number Black Currants Destroyed	Number 8-Hour Man-Days	Number of Nurseries		Number Acres Worked			Number Ribes Destroyed		Number 8-Hour Man-Days
					Sanitation Zone Maintained	Sanitation Zone Abandoned	Nurseries Maintaining Zones	Nurseries Which Abandoned Zones	Total Acreage	Wild	Cultivated	
Idaho	5,233	2,471	16,553	2,341	-	-	-	-	-	-	-	-
Montana	1,311	798	5,080	514	1	-	8,778	-	8,778	1,372,351	-	7,165
Washington	50,050	5,378	78,226	4,218	-	1	-	378	378	20,275	-	640
Subtotal	56,594	8,647	99,859	7,073	1	1	8,778	378	9,156	1,392,626	-	7,805
Wyoming	-	-	-	-	1	-	2,038	-	2,038	73,786	-	567
Total	56,594	8,647	99,859	7,073	2	1	10,816	378	11,194	1,466,412	-	8,372

State	Preeradication Survey		Treatment Infected White Pine				
	Number Acres Mapped White Pine and Protection Zones	Number 8-Hour Man-Days	Number Trees Examined	Number Trees Treated	Number Trees Removed	Number Cankers Removed	Number 8-Hour Man-Days
Idaho	3,318,860	4,475	1,134,116	961,397	38,606	-	2,845
Montana	259,675	798	69,826	65,868	3,762	-	1,137
Washington	146,541	342	344,676	343,767	2,369	-	778
Subtotal	3,725,076	5,615	1,548,618	1,371,032	44,737	-	4,760
Colorado	206,000	290	-	-	-	-	-
Wyoming	323,700	351	-	-	-	-	-
Subtotal	529,700	641	-	-	-	-	-
Total	4,254,776	6,256	1,548,618	1,371,032	44,737	-	4,760

TABLE 4
SUMMARY OF EXPENDITURES FOR 1941

State	Total Federal (All Agencies Including "State W.P.A. Projects")				Recapitulation of Federal Funds							
					Regular Funds				Emergency Funds			
					Bureau of Entomology and Plant Quarantine Leadership and Coordination (3101)	Lea Act (3103)	Forest Service	Department of Interior*	Federal W.P.A.	State W.P.A.	C.C.C.	Total Emergency Funds
Idaho	\$556,019.97	\$1,000.00	\$23,299.13	\$580,319.10	\$62,313.11	\$6,810.78	\$375,898.82	-	\$101,245.76	-	\$ 9,751.50	\$110,997.25
Montana	50,916.83	3,000.00	-	53,916.83	9,090.83	-	33,936.00	-	5,421.00	-	2,469.00	7,890.00
Washington	74,148.19	1,000.00	-	75,148.19	7,222.72	-	35,179.18	\$8,780.63	21,859.66	-	606.00	22,465.66
Subtotal	681,084.99	5,000.00	23,299.13	709,384.12	79,126.66	6,810.78	445,014.00	8,780.63	128,526.42	-	12,826.50	141,752.92
Colorado	-	200.00	-	200.00	-	-	-	-	-	-	-	-
Wyoming	833.69	200.00	-	1,033.69	833.69	-	-	-	-	-	-	-
Subtotal	833.69	400.00	-	1,233.69	833.69	-	-	-	-	-	-	-
Total	\$681,918.68	\$5,400.00	\$23,299.13	\$710,617.81	\$79,960.35	\$6,810.78	\$445,014.00	\$8,780.63	\$128,526.42	-	\$12,826.50	\$141,752.92

*Including National Parks, Indian Reservations and O & C.

State	Recapitulation By Activities (Federal and State)					
	Supervision Including State and District Leaders	Ribes Eradication	Nursery Sanitation	Canker Elimination	Preeradication Survey	All Other (Checking, Field Data and Miscellaneous)
Idaho	\$32,563.35	\$481,828.16	-	\$20,019.66	\$2,800.00	\$43,107.93
Montana	8,247.77	33,611.00	\$3,296.00	1,413.00	-	7,349.06
Washington	4,665.66	50,424.56	-	5,310.51	-	14,747.46
Subtotal	45,476.78	565,863.72	3,296.00	26,743.17	2,800.00	65,204.45
Colorado	-	-	-	-	-	200.00
Wyoming	-	-	-	-	833.69	200.00
Subtotal	-	-	-	-	833.69	400.00
Total	\$45,476.78	\$565,863.72	\$3,296.00	\$26,743.17	\$3,633.69	\$65,604.45

TABLE 4A
SUMMARY OF ALL EXPENDITURES 1918-1941 (INCLUSIVE)

State	Federal (All Agencies Including State W.P.A. Projects)		State (Including All Cooperative Funds) Contributed Service/Ribes Eradication		Grand Total
Idaho	\$10,000,566.66	\$224,861.00	\$243,831.26	\$10,469,258.92	
Montana	970,887.20	106,000.00	-	1,076,887.20	
Washington	1,139,838.92	77,000.00	-	1,216,838.92	
Subtotal	12,111,292.38	407,861.00	243,831.26	12,762,994.64	
Colorado	79,290.00	11,700.00	-	90,990.00	
Wyoming	76,705.65	4,700.00	-	81,405.65	
Subtotal	155,995.65	16,400.00	-	172,395.65	
Total	\$12,267,288.03	\$424,261.00	\$243,831.26	\$12,935,380.29	

State	Recapitulation of Federal Funds							
	Regular				Emergency			
	B.P.I. and B.E.P.Q.	Forest Service	Department of Interior	Federal, W.P.A.	State W.P.A.	C.C.C.	P.R.A.	Total Emergency Programs
Idaho	\$1,234,284.49	\$2,510,551.86	-	\$3,423,164.53	-	\$ 992,539.50	\$1,840,925.78	\$6,255,729.91
Montana	201,043.92	175,070.36	-	333,598.57	-	22,909.50	238,164.85	594,772.92
Washington	219,592.47	134,605.72	\$31,126.00	458,898.95	-	56,095.50	239,520.28	754,514.73
Subtotal	1,654,920.88	2,820,227.94	31,126.00	4,215,762.15	-	1,071,544.50	2,317,710.91	7,605,017.56
Colorado	11,852.04	-	-	59,396.51	-	-	8,041.45	67,427.96
Wyoming	11,314.88	-	-	58,283.96	-	-	7,107.41	65,391.37
Subtotal	23,166.32	-	-	117,680.47	-	-	15,148.86	132,829.33
Total	\$1,678,087.20	\$2,820,227.94	\$31,126.00	\$4,333,442.62	-	\$1,071,544.50	\$2,332,859.77	\$7,737,946.89

State	Recapitulation By Activities (Federal and State)						
	Supervision (Including State and District Leaders)	Ribes Eradication	Cultivated Black Current Eradication	Nursery Sanitation	Canker Elimination	Preeradication Survey	All Other (Checking, Field Data and Miscellaneous)
Idaho	\$470,226.94	\$ 9,021,803.02	\$ 28,173.15	-	\$21,269.66	\$64,731.26	\$ 863,054.49
Montana	61,001.18	736,539.13	22,010.30	\$20,015.27	1,705.50	13,302.91	222,312.91
Washington	46,793.79	717,744.75	63,838.81	2,273.74	5,310.51	5,077.77	375,799.55
Subtotal	578,021.91	10,476,086.90	114,022.26	22,289.01	28,285.67	83,111.94	1,461,166.95
Colorado	12,826.89	49,302.91	-	-	-	6,437.85	22,422.35
Wyoming	11,461.74	46,834.40	-	-	-	7,104.42	16,005.09
Subtotal	24,288.63	96,137.31	-	-	-	13,542.27	38,427.44
Total	\$602,310.54	\$10,572,224.21	\$114,022.26	\$22,289.01	\$28,285.67	\$96,654.21	\$1,499,594.39

TABLE 5

SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIP, 1941

Land Ownership	Initial Eradication			Reeradication			Totals		
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days
National Forests R-1	17,382	3,285,924	18,493	30,111	3,061,606	33,252	47,493	6,347,530	51,745
O and C Revested Lands	-	-	-	-	-	-	-	-	-
Other Public Domain	-	-	-	333	30,650	385	333	30,650	385
National Parks	60	3,016	51	1,419	69,311	1,583	1,479	72,327	1,634
Indian Reservations	-	-	-	-	-	-	-	-	-
Subtotal Federal	17,442	3,288,940	18,544	31,863	3,161,567	35,220	49,305	6,450,507	53,764
State and Private R-1	2,783	442,346	2,976	19,129	1,876,927	21,525	21,912	2,319,273	24,501
Grand Total	20,225	3,731,286	21,520	50,992	5,038,494	56,745	71,217	8,769,780	78,265

NATIONAL PARKS

	Initial Work			Reeradication Work			Totals		
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days
Mount Rainier	-	-	-	1,419	69,311	1,583	1,419	69,311	1,583
Glacier	60	3,016	51	-	-	-	60	3,016	51
Total	60	3,016	51	1,419	69,311	1,583	1,479	72,327	1,634
STATE AND PRIVATE LANDS									
Idaho	1,654	359,946	2,311	17,811	1,677,012	20,122	19,465	2,036,958	22,433
Montana	1,129	82,400	665	193	24,260	271	1,322	106,660	936
Washington	-	-	-	1,125	175,655	1,132	1,125	175,655	1,132
Total	2,783	442,346	2,976	19,129	1,876,927	21,525	21,912	2,319,273	24,501
NATIONAL FORESTS									
Clearwater	92	-	-	4,132	-	-	4,224	-	-
St. Joe	4,458	-	-	11,601	-	-	16,059	-	-
Coeur d'Alene	3,087	-	-	4,226	-	-	7,313	-	-
Kaniksu	6,355	-	-	7,958	-	-	14,313	-	-
Cabinet	3,390	-	-	2,194	-	-	5,584	-	-
Total	17,382	3,285,924	18,493	30,111	3,061,606	33,252	47,493	6,347,530	51,745

TABLE 5A

SUMMARY OF RIBES ERADICATION BY LAND OWNERSHIPS 1918-1941 (INCLUSIVE)

Land Ownership a	Total Acreage of White Pine Worth Protection b	Control Areas		Initial Eradication		
		Total Acreage* (White Pine and Protective Zones) c	Acreage Not Yet Worked Initially d	Net Acreage Worked e	Number Ribes Destroyed f	Number 8-Hour Man-Days g
National Forests R-1	1,392,925	1,322,765	288,617	1,034,148	214,713,832	923,706
National Forests R-2 and 4	421,000**	421,000**	384,381**	36,619	1,496,420	13,232
Subtotal	1,813,925	1,743,765	672,998	1,070,767	216,210,252	936,938
Other Public Domain	31,905	30,865	14,068	16,797	2,807,572	10,896
National Parks	110,054**	43,954**	33,067**	10,887	1,964,348	12,903
Indian Reservations (Shoshone)	11,000**	11,000**	11,000**	-	-	-
Subtotal Federal	1,966,884	1,829,584	731,133	1,098,451	220,982,172	960,737
State and Private	1,244,660	1,114,128	292,433	821,695	144,066,594	554,883
Grand Total	3,211,544	2,943,712	1,023,566	1,920,146	365,048,766	1,515,620

*Column d + column e equals column c. The total of column e of this table should agree with the total of column f of Table 1A.

**Indefinite

Land Ownership	Reeradication Work			Totals (Initial and Rework)		
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days
National Forests R-1	220,805	29,016,467	251,551	1,254,953	243,730,299	1,175,257
National Forests R-2 and 4	1,962	86,886	664	38,581	1,583,306	13,896
Subtotal	222,767	29,103,353	252,215	1,293,534	245,313,605	1,189,153
Other Public Domain	5,527	791,033	6,212	22,324	3,598,605	17,108
National Parks	6,768	481,347	7,679	17,655	2,445,695	20,582
Indian Reservations	-	-	-	-	-	-
Subtotal Federal	235,062	30,375,733	266,106	1,333,513	251,357,905	1,226,843
State and Private	174,501	30,190,500	175,634	996,196	174,257,094	730,517
Grand Total	409,563	60,566,233	441,740	2,329,709	425,614,999	1,957,360

SUMMARY OF RIBES ERADICATION ON NATIONAL PARKS 1918-1941 (INCLUSIVE)

National Parks a	Total Acreage of White Pine b	Control Areas		Initial Eradication		
		Total Acreage* (White Pine and Protective Zones) c	Acreage Not Yet Worked Initially d	Acreage Worked e	Number Ribes Destroyed f	Number 8-Hour Man-Days g
Mount Rainier	8,254	8,254	-	8,254	1,640,507	10,070
Glacier	20,000	10,000	7,367	2,633	323,841	2,833
Yellowstone	69,000	12,900	12,900	-	-	-
Grand Teton	5,800	5,800	5,800	-	-	-
Rocky Mountain	7,000	7,000	7,000	-	-	-
Total National Parks	110,054	43,954	33,067	10,887	1,964,348	12,903

*Column d + column e = column c.

National Parks	Reeradication Work			Totals (Initial and Rework)		
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days
Mount Rainier	6,768	481,347	7,679	15,022	2,121,854	17,749
Glacier	-	-	-	2,633	323,841	2,833
Total National Parks	6,768	481,347	7,679	17,655	2,445,695	20,582

TABLE 5A (Continued)

SUMMARY OF RIBES ERADICATION ON STATE AND PRIVATE LANDS 1918-1941 (INCLUSIVE)

State and Private Lands #	Total Acreage of White Pine b	Control Areas		Initial Eradication		
		Total Acreage* (White Pine and Protective Zones) c	Acreage Not Yet Worked Initially d	Acreage Worked e	Number Ribes Destroyed f	Number 8-Hour Man-Days g
Idaho	1,145,975	1,017,933	264,579	753,354	125,638,742	489,088
Montana	37,215	34,725	12,894	21,831	2,773,348	14,835
Washington	61,470	61,470	14,960	46,510	15,454,504	50,960
Total	1,244,660	1,114,128	292,433	821,695	144,066,594	554,983

*Column c = column d and column e.

State and Private Lands	Reeradication Work			Totals (Initial and Rework)		
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days
Idaho	155,065	26,094,546	153,655	908,419	151,933,288	642,743
Montana	3,227	441,189	4,112	25,058	3,214,537	18,947
Washington	16,209	3,654,765	17,867	62,719	19,109,269	68,827
Total	174,501	30,190,500	175,634	996,196	174,257,094	730,517

SUMMARY OF RIBES ERADICATION ON NATIONAL FORESTS 1918-1941 (INCLUSIVE)

National Forests #	Total Acreage of White Pine b	Control Areas		Initial Eradication		
		Total Acreage (White Pine and Protective Zones)* c	Acreage Not Yet Worked Initially d	Acreage Worked e	Number Ribes Destroyed f	Number 8-Hour Man-Days g
Clearwater	204,730	195,870	47,684	148,186	-	-
St. Joe	312,080	300,991	84,823	216,168	-	-
Coeur d'Alene**	358,395	348,092	34,716	313,376	-	-
Kaniksu	354,195	327,993	74,961	253,032	-	-
Cabinet	76,630	74,318	17,703	56,615	-	-
Kootenai	86,695	75,501	28,720	46,781	-	-
Subtotal Region One	1,392,925	1,322,765	288,617	1,034,148	214,713,832	923,706
Region Two	394,000	394,000	357,381	36,619	1,496,420	13,232
Region Four	27,000	27,000	27,000	-	-	-
Total	1,813,925	1,743,765	672,998	1,070,767	216,210,252	936,938

*Column c = column d and column e.

**Includes Forest Service land in Mount Spokane unit.

National Forests	Reeradication Work			Totals (Initial and Rework)		
	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days	Acreage Worked	Number Ribes Destroyed	Number 8-Hour Man-Days
Clearwater	51,105	-	-	199,291	-	-
St. Joe	72,394	-	-	288,552	-	-
Coeur d'Alene	52,085	-	-	365,461	-	-
Kaniksu	37,948	-	-	290,980	-	-
Cabinet	6,108	-	-	62,723	-	-
Kootenai	1,165	-	-	47,946	-	-
Subtotal Region One	220,805	29,016,467	251,551	1,254,953	243,730,299	1,175,257
Region Two	1,962	86,886	664	38,581	1,583,306	13,896
Region Four	-	-	-	-	-	-
Total	222,767	29,103,353	252,215	1,293,534	245,313,605	1,189,153

STATUS OF BLISTER RUST CONTROL 1918-1941 (INCLUSIVE)

State	Control Area Including Border Zones (Acres)	Net Control Area Initially Protected (Acres)	Control Areas Reworked Subsequent to Initial Protection (Acres)	Number 8-Hour Man-Days (Man-Days)	Ribes Destroyed (Wild and Cultivated) (Number)	Remaining Control Area Needing Initial Protection (Acres)	Estimated Protected Area Now on Maintenance Basis* (Acres)
Idaho	2,122,119	1,632,535	360,481	1,705,666	372,682,032	489,584	657,427
Montana	194,544	127,860	10,500	101,768	17,773,689	66,684	67,208
Washington	169,549	123,132	36,620	136,010	33,575,972	46,217	47,205
Subtotal	2,486,012	1,883,527	407,601	1,943,464	424,031,693	602,485	771,840
Colorado	206,000**	14,859	1,962	6,956	497,535	191,141	8,000
Wyoming	251,700**	21,760	-	6,940	1,085,771	229,940	9,000
Subtotal	457,700	36,619	1,962	13,896	1,583,306	421,081	17,000
Total	2,943,712	1,920,146	409,563	1,957,360	425,614,999	1,023,566	788,840

*Maintenance - Any portion of a control area that has through artificial (eradication of ribes) or natural treatment (shading out of ribes) acquired a status wherein the scarcity of ribes assures effective blister rust control for an indefinite period, such that no further work (except perhaps scouting) is expected to be needed during the current forest cycle. This status continues for a very number of years until, after a major ecological change, a renewed increase and growth of ribes again endangers the pine, and these areas then revert to a rework status.

**Indefinite